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NEW METHOD

For the IMPROVEMENT of the
Manufacture of DRUGS:

In a TREATISE on the
ELIXIR PROPRIETATIS:

—*Quæ tibi putaris prima, in experiundo ut repudies.*
TERENT. Adelph. Act. 5. Scen. 2.



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NEW METHOD

OF TEACHING

ARITHMETIC

AND ALGEBRA

BY J. H. COOPER

Author of "The New Method of Teaching Arithmetic and Algebra"



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TO THE
MANUFACTURERS
OF
DRUGS.

TO You this Paper is presented ;
for Your Use it was wrote ; and
if you approve of it, I shall think my
Time to have been well laid out.
The improving an Axe for the hewing
of Wood, or the rendering a Bucket
more fit for drawing of Water, seems
to be of more Use to the Common-
wealth, than learned and abstracted
Dissertations on what *We* cannot under-
stand ; Such refined Notions may en-
tertain those who can comprehend
them ; but are no-ways adapted to the
Tillers of the Earth, nor to those who
manufacture

manufacture its Produce ; who, as they make up the greater Part of Mankind, are intitled to a great Share in the Consideration of each Individual. For this Reason a Treatise on any Manufacture may be of Service. This upon Drugs is offer'd to You, as the properest Judges of it ; and I hope it will find such Acceptance, as must be wished for from such Judges. I am

Your obedient humble Servant,

July, 1746.

THE AUTHOR.

CHAP.

C H A P. I.

On the MANUFACTURE of DRUGS.

THE following Experiments and Observations were made for the Improvement of *Pharmacy*. The three Simples here treated of were first chosen on account of the Composition they enter; but, in the Progress of the Trials which were made upon them, such Appearances occurred, as gave Cause to extend the Design farther; that is, to form a Method, which might serve not only for the Improvement of Them, but of all manner of Simples: For which Reason this is offer'd as a Specimen only of a Method for manufacturing the whole *Materia medica*, thought to be more consistent with the true Rules of Art, than those generally practised. By the Simplicity of the Manner in which they are here treated, we may expect to find the Principles of each Drug in the Condition Nature intended them: For the severe and torturing Method of handling simple Medicines, so much prevailing among the modern Chemists, alters them so greatly from what they were, that it is not possible to come at such a Knowledge of them (by such means) as would enable us to make the necessary and most useful Inductions: Therefore by the simplest Means only, the Manufacture of Drugs can be best improved for the Use of the Sick.

In order to reduce the following Observations, and the Experiments previous to them, into Method, for the Use of the Reader, Classes are here formed for such Productions, as the Simples treated of may be supposed to belong to. These Classes are derived from Experiment, not Analogy; to one of which are to be referred all Productions, that, upon the like Trials, agree: But, if they turn out different from any Classes here laid down, they are to rest so, till a Class may be formed for them. Therefore this Method cannot be a general one, but a Specimen, to be extended to all kind of Simples, by varying the Classes, according to the Differences of the Textures, and component Parts of the Simples, which shall happen to be the Subject of future Experiments.

By these means it is hoped the Medicinal Art will receive some Advantages; if the rectifying egregious Errors, occasion'd by a false Denomination of Drugs, be such. For Instance, If a Gum be treated as a Resin, because so called, and a Resin as a different Simple from what it is, their Properties are liable to suffer much by that Treatment. 'Tis to be remarked, that these Errors are handed down to us from the best Writers; by which Authority the Mischief is the more readily propagated; for they who prepare these Medicines have great Reason to take such Accounts for Truths, knowing from whence they are derived. Thus we are told, that (a) *Sandarac*, or the Resin of the Juniper-Tree, is an anomalous Resin, not easily to be dissolved. Which is so far from being so, that every Varnice-Maker can contradict it.

And (b) *Olibanum*, which is an oily Gum (as I have proved by Trial), is called a Resin, by every
Writer

(a) Hinc aptus est solvere multa alia, difficulter dissolvenda, ut Myrrham, G. Sandaracha, &c. (*Boerb. process. ch. p. 61.*)

(b) Resina est duriuscula, &c. Liquor est resinofus, duriusculus, &c. (*Manget. Mess. Med. Spagyr. de Thure vel Olibano.*)

Writer on the *Materia Medica* that I have met, and, for the most part, treated as such in Pharmacy.

Zwelfer, whose Authority has been deservedly very great in the Pharmaceutical World, has some Errors proper to be taken notice of in this Place: He orders Gum-Resins rather to be dissolved in Turpentine, and such-like Balsams; because, says he, as Turpentine is of their Nature, they will readily dissolve in it; which neither Wine nor Vinegar will accomplish. *Append. ad Animadvers. p. 26. in Theriac.*

But the following Experiments will shew this Doctrine to be erroneous, by proving such Treatment to be inconsistent with their component Parts.

We

See also *Dale's Pharmacolog. Herman's Cynosur. Mater. medic. Geoffroy's Materia medica, Tom. 2.*

This last Author, when he compares *Olibanum* to Mastich, unknowingly, discovers that it was not a Resin, but, what it truly is, an oily Gum, or Gum-Resin. His Words are, “Nec accensa diffluit, ut Mastiche, dentibus statim comminuitur; verum comminuta non cogitur denuo, ut Mastiche, neque, sicut ea, in ore libere volutari potest, cum dentibus adhærescat.” --- The *Saliva* mixing with it begins to dissolve it, which hinders the Reunion of its Parts. Were it a Resin, like Mastich, the Parts, first divided by chewing, would reunite by the Heat of the Mouth, upon continuing of that Chewing. (I confess the Chewing of Myrrh first hinted to me what it was, which I have since confirmed.)

To this Account of *Geoffroy's* we may add that of a very great Author of our own Country, from whom *Geoffroy* probably took the above, they resemble each other so much. These I mention, to shew how uncultivated a Field *Pharmacy* is: “Sed nihil per incendium stillat, ut Mastiche; dentibus statim friatur, verum friatura non cogitur denuo, ut Mastiches, neque ut ea libere volutari potest, cum dentibus eorumque præsepilis adhærescat.” *Raii Hist. Plant. p. 1840. Tom. 2.*

Herman was so convinced of its being a Resin, that he says of it, “Mastiche fragrantius et suavius, cæteroquin cum ipso convenit.” And we all know Mastich to be a Resin. *Herm. Cynos. Mat. med. p. 205.*

We may add to these (c) *Myrrh*, which has been surprisngly mistaken by most Authors, when chemically treated, or otherwise handled in Pharmacy ; which, as it is one of the Three following Simples, will shew itself strangely different from what it has generally been thought, from the Trials here made upon it. Such Errors as these, arising from the Ignorance of the Workers of Medicines of the Materials to be wrought upon, are frequently to be met ; and these I would wish to have rectified by the following Experiments :

Pharmacy, instead of rendering less effectual, should improve, the Power of every Medicine. It must be a great Disappointment to the Physician, and an Injury to the Sick, when a Medicine, that, in its simple State, is possessed of certain Properties, upon which its Virtue and Efficacy depend, does not act at all to his Expectations ; whilst this Defect is occasion'd by a Change of its Form only ; and this merely at the Request of the Patient, or, perhaps, his own Fancy ; because he did not know, that That Simple would bear such a Preparation innocently, as may be necessary to change it to that Form. For this Reason, perhaps, several Medicines handed down to us from our earliest Ancestors, strongly recommended, too frequently disappoint the Prescriber ; namely, because they are prepared with too much Art, which was not the Manner of the Antients.

Thus *Aloës* (d), whose medicinal Qualities are thought to be improved by washing it, and separating its Resin, is found to have lost much of its purgative Quality by this Treatment, and must probably be injured by it in other Respects : Yet the Opinion of its gaining by this Manner of Preparation has so prevailed, that we have it continued in almost every Dispensatory, either under this Form, or one somewhat

(c) See *Boerhaav. Proc. chem.* p. 61. & 110. &c.

(d) *Frederic. Hoffm. Obs. Ph. ch.* p. 168.

what analogous to it. We find likewise, in the Preparation of other Simples, such an Alteration in their sensible Qualities, as may give us just Cause, without the Help of Experiment on the human Body, to conclude their original Virtues, on which their Efficacy depends, must be either intirely lost, or much weaken'd, as in the distill'd Water of the biting Arse-smart, or *Hydropiper*; in which we find no Signs of that Acrimony or Warmth which prevailed in the Herb before Distillation. So that if the Virtues imputed to this Herb be derived from its sensible Qualities, we have no Reason to believe that there are any of them in the distill'd Water, or its Decoction, whatever new Qualities may be acquired by that Treatment; notwithstanding which, this Water has a great Character given it by a very great * Authority.

The like may be said of the Decoction and distill'd Water of *Arum* Roots; neither of which Preparations have any Remains of that powerful Acrimony remarkable in the Simple from whence they are taken. And as the *Garden-Dragon* is of the like Nature and Species, we may conclude it suffers alike; and therefore, that neither of them can be of Use in those Compositions which they enter, when so prepared; as in the *Aquæ Epidemiæ*, *Aq. Raphan. c.* &c.

The like happens to most of the *Cress* Kind, and some of the antiscorbutic Plants, according to the *Schola Salernitana*.

To these we must also add what Dr. *Boerhaave* says of one particular Plant: “ We can never find “ (says he) the inimitable Virtues of *Plantain-Juice* “ in its distill'd Water.”

Many more Instances might be brought from Authors of Credit, in Favour of a more simple Preparation

* Mr. Boyle.

paration of Drugs than is usually found in the present Practice*.

As I have included the Chemic: and Galenic: Pharmacy under One Denomination, the *Manufacture of Drugs*, it were to be wished also that we could reduce them to One Art. This too might be attained, by throwing out of each of them the more elaborate and perplexed Preparations; insomuch that the one would seem almost to be lost in the other: From whence would arise a single Profession, practicable to every Apothecary. By these means the Physician would be much surer of the Virtues of his Drugs, as they would be less liable to suffer from the Inexpertness of the Operator; which Evil Pharmacy will never be thoroughly free from, till it gets rid of those more elaborate Preparations. I do not mean by this to vote extensive Chemistry out of Doors: For, whilst such Uses can be made of this Art, as may be found in some philosophical Writings, as in Sir *Isaac Newton's* 31 Q. and elsewhere, Chemistry will never die; but, in Pharmacy, an Abridgment seems to be wanting. To prove this farther, I will add the following Instances:

Till M. *Boulduc* from Experiment assured us, that (e) *Jalap-Root*, simply given, was a better purging Medicine than its Resin, the chemical Preparation prevail'd. And the essential Difference between these

two

* N. B. This Paper was intended for the Press before the new *Pharmacopœia* was published.

(e) Of which *Geoffroy* also says, “*Jalapa vero nulla indiget emendatione, sufficiente terræ quantitate extenduntur salinæ et sulphuræ partes, ita ut nulla melior sit hujusce medicamenti præparatio, quàm ipsamet ejus substantia.*” *Geoffroy's Mat. medica.*

And the same Author says of its Resin, “*Sed resina non uberius evacuat, imo sæpe minus, sed semper cum molestia et torminibus.*”

And *Quincy* justly observes, That some take great Pains to extract this Resin, but afterwards Correctors are wanted for it.

two will appear to any one who will take the Trouble to boil this Root in Water, by which it becomes a mere *Parenchyma*, or pulpy mucilaginous Substance; thro' which, in the natural State, the Resin is diffused. In extracting the Resin, this Mucilage is intirely rejected; which cannot be an Improvement of this Medicine, if the Mucilage was intended as a soft Covering to envelope this acrid Resin, in order to make it operate (*cum euphoria*) with less Irksomeness to the Bowels, which is highly probable.

In the like manner the *Colocynthis*, in the *Extract. Rudii, Ph. Lond.* suffers, by the chemical Treatment there directed, by rejecting its *Mucus*: Which Error the Compilers of the *Edinburgh Pharmacopæia* observing, have judiciously avoided, by substituting Water to extract its medicinal Quality, instead of strong Spirits of Wine.

To these we may add most of the Preparations from the Mineral Kingdom; some of whose Virtues sufficiently recommend them, yet whose Manner of Preparation is so nice, and requires such Accuracy in the Artist to render them fit to produce those Virtues, that the Hazard of erring in the Processes is a sufficient Motive to expunge them totally from the List of officinal Medicines, or that they be made only occasionally, when the Operator knows he shall be properly rewarded both for his Knowledge and Trouble. For, whilst he is supported by the Profits arising from these Preparations, he will scarce have Virtue enough to throw every one out of Doors, that a mischeivous Accident should spoil in the Making, as too often is the Case; whilst the ill Effects of this Accident may be so palliated, as to render it still vendible. But, where the Manner of preparing them is more simple, they are, in proportion to that Simplicity, more likely to be better prepared, as the fewer Accidents may attend them: For want of which Rule, the Corruptions of this Art

are brought to such a Pitch, that the Fraud of the Chemist is found to be always in proportion to his Ingenuity; which consists in adapting all his Preparations to the Buyer's Purse; who, if he cannot purchase the genuine, may be supplied with one so like it, that the *Roman Ancilia* could not resemble each other so well as these do: And yet none but an ingenious Chemist can discover these Frauds, or he to whom he pleases to reveal this Art. These false Preparations are sometimes made to appear more agreeable to the Eye than the true; by which Artifice the false is too often preferr'd by the unskilful Buyer.

The following Experiments were made, not for a Search into the Virtues of Simples, but for a Knowledge of their Texture only, for Information in the true Method of preparing them for Use. Those published by M. *Tournefort*, and *Geoffroy*, which are lasting Instances of the prevailing Manner of trying Simples with Severity of Fire, cannot be a proper Way to teach us how to manufacture them, nor yet to find out their Virtues; the End for which the Trials were made.

C H A P. II.

Of the ELIXIR PROPRIETATIS.

PARACELSUS, the Author of this Medicine, has ascribed to it most extraordinary Virtues, as have most of his Successors; and the modern Writers have such an Esteem for it, that we find a Method for preparing it in all the Dispensatories in present Use.

On account of this great Credit it has gained, every Operator of Note in Chemistry, who has had Occasion to talk of it in a public Manner, has endeavoured to improve it by some new Process or other, by which they imagined the Virtues of each Simple would be better extracted, than by any Method then in Use; but have all come short, as it is supposed, of the Process which the Author of this Medicine used; who, whilst he gives it incredible Properties, most ungenerously conceals Part of his Method, which has set so many People on the Search; yet, if his Method were known, it would probably do little more than the same Materials prepared according to the true (a) Rules of Art; that is, Rules agreeable to the Texture of the Ingredients. For this Reason I have thought it worth while to make some Experiments on the Simples of this Composition, leaving the Reader to form such a Process from them as he shall approve of.

Before we proceed, it will be necessary to inquire, whether Part only of each Ingredient, or its whole Substance, should be dissolved in the *Menstruum*, so
as

(a) Non prorsus frustra *Paracelsus* de *Elixir Proprietatis* ----
“ sibi fides est, modo non errâset in ejusdem præparatione.” *Van Helmont, Aracn. Paracelsi,*

as to bring about what the Author of this *Elixir* intended, or what the modern Physicians would expect from it. For this we must refer to *Paracelsus's* own Words, and, on account of their Obscurity, to *Crollius* also; who, I think, published the first rational *Formula* for this Medicine: The first orders the *Myrrh*, *Aloës*, and *Saffron*, to be put into a *Pelican*, and left in Sand, to ascend gently for two Months. By this it is probable he means the aromatic Vapours should circulate so long; for the *Pelican* is a circulating Glass, now grown obsolete. After two Months are finished with this Part of the Process, the Oil of the Ingredients is ordered to be separated by an Alembic; an equal Part of which is to be mixed with his *Circulatum*, and then digested for a Month, and so his *Elixir* is finished.

What this *Circulatum* is, is not plain; and therefore *Crollius's* Method is the Standard, from whence the modern *Formulæ* are derived; excepting such as are taken from *Van Helmont*.

Crollius then directs two Kinds of Spirits of Wine, with an Addition of Oil of Sulphur, to be used to extract the Properties of these three Ingredients; the one, *Alcohol Vini*, the other, *Bonum Spiritum Vini*; perhaps good Brandy, or what the Artists call Double Proof-Spirit; that is, a Spirit between good Brandy and *Alcohol Vini*: And, lastly, he orders a gentle Distillation of the *Magma*, in Imitation of *Paracelsus*, after his *Menstruum* has dissolved all it could of the Ingredients.

By the first Method, nothing is used of these Ingredients, but what rises by Distillation from the dry Ingredients, which is their Oil. This Method being now no-where practised, *Crollius's* is the Standard; the Virtues of whose *Elixir* depend upon whatever the two Kinds of Spirit of Wine will dissolve, join'd with a mineral Acid, including whatever will rise in Distillation from the *Magma*. But *Paracelsus*

plainly

plainly tells us, the Oil only is to be used, dissolved in that unknown *Menstruum* his *Circulatum*. And, by the Virtues he gives this Medicine, 'tis plain he intended the Oil only should be used: For, when he talks of such Things as preserve from Corruption, &c. he says, *Aliquæ vero servant in perpetuum sine fine, prout Balsamum*: And others keep Bodies in their Vigour, as *Myrrh* and *Aloës*; from whence we may suppose he meant the Balsam or Oil of these Simples only: Yet, notwithstanding this Author's exprefs Words for using the Oil only, various Attempts have been made to dissolve their whole Substances. And tho' it is most likely, that neither *Myrrh* nor *Aloës* have such powerful Virtues as he has given them, it is probable whatever they have, must be derived from their whole Substances. And this seems to be the general Opinion, from the various Attempts made that way, as is already mention'd; particularly, to dissolve the *Myrrh*(b) intirely; in which consisted the whole Secret, which has been for so many Years a Stumbling-block to the Chemists.

Charras, an Apothecary of high Credit at *Paris* in his Time, and a Worker in Chemistry also, has made a bold Attempt, in a troublesome Process on this *Elixir*, to dissolve the whole Substances; which has likewise been aimed at by (c) others of higher Pretensions in Physic, with no better Success, and perhaps in Imitation of him.

In the following Trials I have endeavour'd to shew what *Menstruums* are fittest to take up all or Part of the Principles of these Ingredients; leaving the Choice of

(b) "Sed optime paratur secundum *Paracelsum*, si operator nôrit verum modum dissolvendi *Myrrham*, in quo totius rei cardo vertitur." *Vigani Medulla Chemiæ*, p. 38.

And again Dr. *Freind* says: "Ita de *Myrrha* recte satis esse videtur *Vigani* sententia, qui eam in vulgatis *Elixiribus* fere intactam relinqui statuit." *Freind de Digestione in Prælect. Chem.* See also *Boerb. de Tinct. Myrrhæ*.

(c) *Boerhaav. de Elix. Proprietatis*.

of what is properest for the Sick to the knowing Physician.

Altho' I may seem to have in View only the Improvement of this *Elixir* in these Experiments, yet the Reader may find other Advantages resulting from them, perhaps of more Moment than any Improvement this *Elixir* can admit of: For, in shewing the Treatment due to *Myrrh*, I have also attempted a Method of treating all lactescent or oily Gums for pharmaceutical Uses. In the Experiments on *Aloës* is shewn, how fallacious a Rule it is, to pronounce any Simple to be of any determined Class of Medicines by Analogy only, for there it shews a Texture, or rather Principles, which the Writers on that Drug are not at all acquainted with.

The Nature of *Saffron* is also inquired into, to know how that Simple should be treated in general, as well as what Class of vegetable Productions it belongs to: A Thing not thoroughly determined.

The *Myrrh* is dwelt most upon, as all our modern Operators have erred in handling it pharmaceutically; which arose from a Prepossession they had of the (*d*) Singularity of its Texture; the unfolding of which was to have produced surprising salutary Effects on the human Body; yet we may learn so much of its Nature from (*e*) antient and (*f*) modern Authors, as ought to have removed this Prepossession.

In

(*d*) "*Myrrha est anomala gummi-refina.*" *Manget. Mess. Med. Spagyr. in notis de flor. Sulph. & Myrrh. p. 337.*

Boerb. Theor. Chem. p. 62. & Tom. 2. Proc. 57.

"*Myrrha et Succinum quæ firmioris consistentiæ sunt digestioni difficiliter parent.*" *Freind de Digestione Prælect. Chem.*

How established an Error must this be, when Doctor *Freind* could assert *Myrrh* and *Amber* to be alike in Texture! The one a fossile Resin, the other a compound vegetable Gum, as will appear upon Trial.

(*e*) "*Adulteratur admisto gummi, quod Myrrhæ diluto antea maduerit.*" *Dioscorid. Interpret. Marcello Virgil. p. 83.*

(*f*) See *Valentin. Musæ. Musæor. p. 252. ff. 2. p. 256. ff. 6.*

In order to explain fully what it is, as well as the other Simples joined with it, we will form such Classes as are to our Purpose, in order to find out to which they belong ; whether to any of these following, or such as are not inserted here : By which we may come to a Knowledge of their Principles, or constituent Parts, and, of consequence, learn how they should best be prepared ; that is, without injuring their native Properties ; the Thing sought for in this Treatise.

And *Hoffman* says of it, “ Dum hæc præter spirituosum etiam
 “ aqueo menſtruo obtemperat, inter gummata balsamica
 “ Myrrha, &c.” *Hoff. Obſ. Ph. Chem. p. 57.*
 See alſo *Angel. Sala de Solutione Bdellii & Myrrhæ.*

C H A P. III.

CLASS I.

Of SIMPLE GUMS.

SIMPLE Gums have been the (a) mucilaginous Juices of Plants ; which, bursting their Vessels, have, by the Heat of the Sun, been reduced to the Consistence and Form we see them of, by the Evaporation of the Moisture, which was the Cause of their Fluidity, and therefore may, by the Addition of the like Moisture, be reduced to their former fluid State. In these there is no visible Portion of Oil ; therefore, as simple mucilaginous Bodies, they will dissolve only in watry *Menstruums*. Of this kind are *Gum. Arabic. G. Tragacanth. G. Senega. G. Cerasor.*

The Word Gum was applied, by *Dioscorides* and others, to *Gum. Arabic.* or the mucilaginous Juice of the *Egyptian Thorn* only ; as if there was no other simple Gum known in Medicine at that time, as appears from his Writings ; For, when this Simple had been mixed with other Drugs by the Trader, to adulterate them, he says, “ *Adulteratur admisto* “ *Gummi, &c.*” pag. 83. *de Myrrha.*

CLASS II.

Of OILY GUMS, commonly called GUM-RESINS.

THESE are made up of the foregoing *Mucus*, or some simple Gum, with a Mixture (b) of some sulphureous Matter, whether Oil, Balsam, or Resin,

(a) See *Grew* of the Generation of Liquors in Trunks, §. 17.

(b) See *Angel. Salæ Essent. vegetab. anatom. Sect. vi. Cap. iv. & v. & Hydrelæolog. S. 2. Cap. 9.*

Resin, blended together, by means, as we are taught, of some native vegetable Soap (c) supposed to be inherent in all Vegetables. These have been the lactescent (d) Juices, that, bursting the Coats of their Vessels, have acquired their gummy Consistence, by the Evaporation of their Moisture; which therefore may, by means of the like Moisture, be reduced to their former fluid State; that is, into a lactescent Juice or Emulsion. Of this kind are *Gum. Opopanax*, *G. Ammoniac*. *G. Galbanum* (when in Tears) *G. Sagapenum*, *G. Bdellium*, *G. Myrrha*.

CLASS

(c) See *Boerhaav. Element. Chem. de Sapone*.

Dr. *Grew* thinks, that a volatile Salt unites the Oil with the Water in these milky Juices of Plants, or natural Emulsions, of which the oily Gums are made. *Grew of the Bark in the Anatomy of Roots*, ff. 19.

(d) See *Grew* of the Bark of Roots, ff. 19, 20, 21. And of the Generation of Liquors in the Vegetation of Trunks, ff. 16.

This milky Juice is called by Dr. *Boerhaave*, *Succus proprius vegetabilis*, to distinguish it from the other fluid Parts of Vegetables, which, to this, are in an imperfect or half-formed State, and of another Nature; therefore this Juice is never to be got from Plants by bruising and pressing them, as is erroneously asserted, by Authors of Credit, of *Opium* and *Aloës*, &c. By bleeding and wounding the Plants properly, it is only to be extracted, lest the other Juices mix also, upon bruising and pressing the Vegetables; by which would be formed a Substance remarkably different.

To this *Van Helmont* had such a Regard, as to give the following Caution to the Unexperienced: “*Chelidonia plorat aureum* “*et Tithymallus lacteum succum, ex Petasitide gummi, ex Cha-* “*mæleonte, Ixia, &c. quorum simplicia si contuderis, alium et* “*inferiorem longe succum, stercus nimirum, cruoremque san-* “*guini permista exhibebunt, utut clarificentur. Sanguinem* “*enim a cruore et parenchymate plantarum distinguere et sepa-* “*rare discant tyrones, si quicquam laude dignum per simplicia* “*egisse meditentur unquam.”* *Van Helmont. Dispensat. mod.*

This *Sanguis* and *Cruor* of Plants, according to the above Doctrine, is fairly explained in *Opium* and *Diacodium*, whose Doses, for that Reason, are so remarkably different, were the Sugar deducted from the *Diacodium*, and its Decoction evaporated to the Consistence of *Opium*.

CLASS III.

Of VEGETABLE RESINS, and their BALSAMS.

ALL vegetable Refins have been Balsams, or acid (e) oily Liquors, in which there is a small Portion of Phlegm, indissoluble in Water, but very easily soluble in their proper sulphureous *Menstruums*. Of this kind are *G. Mastich.* *G. Guajacum.* *G. Juniper.* *G. Benzoin.* (all falsely called Gums).

We must here except a Set of Refins, thought to be vegetable, which have something in their Texture that renders them very untractable in the Hands of the Chemist; which are, *G. Lacca,* *G. Copal.* *G. Anime,* *Cera.*

CLASS IV.

Of FOSSILE RESINS and BALSAMS,

THESE are the Production of the Earth, which, in their Intractability, agree with the foregoing excepted or anomalous Refins, but may be more easily traced to their Principles; these being, probably, the Result of a strict Union of a mineral Acid, and some oily Body. Of this kind are *Amber,* *Asphaltum,* *Pisselæum Indicum,* *Petroleum.*

The Design of adding fossile Balsams and Refins here, is to shew the Difference between these and the vegetable; and, from thence, to prove, that the Manner of imitating vegetable Refins, laid down by Authors of Credit, is not conclusive of the Ends they proposed;

(e) See Grew, of Liquors in Trunks, §. 15.

Hoffman. Obs. Ph. Ch. p. 24.

Geoffroy de plantar. succis liquid. et concret. in Mat. med.

proposed, otherwise this Class would be of no Use, because the Subjects of this Treatise are Vegetables.

Of SIMPLE GUMS of the first Class foregoing, imitated by Art.

TO confirm the Definitions of the foregoing Classes, we will endeavour to imitate them.

Take any mucilaginous (*f*) Vegetable, whether Seed, Leaves, or Root, and, by the gentlest Infusion in common Water, extract the *Mucus*; evaporate this dissolved Mucilage, by a slow Heat, to a gummy Hardness, and you will have an artificial simple Gum of the first Class, but less tenacious than the natural; which, by means of Water, may be reduced, like the natural, to its former fluid State; and, like it, is indissoluble in sulphureous or oily *Menstruums*.

These Mucilages, by long Evaporation, lose much of their Tenacity; so that, by the time they are brought to the Consistence of a Gum, their Sizziness is greatly broken; which should give a Caution not to use much boiling in preparing mucilaginous Medicines from Vegetables, as in the *Syrup. de Althæa, de Symphyto, &c.*

It seems as if the Tenacity of these Mucilages was in Proportion to the Solidity of the Vegetables from whence they are taken; that is, that they are more so from Trees than Herbs. For the Mucilages of *Althæa, S. Lini, S. Psyllii*, are not of so strong a Texture, as that from the Cherry-Tree, Plum-Tree, the Holly, of which Birdlime is made, or the *Egyptian Thorn*, from whence Gum *Arabic* is said to flow.

How

(*f*) Simple unoily Gums are but dried Mucilages. Grew of the Generation of Liquors in the Vegetation of Trunks, §. 17.

How absurd is it then, to attempt to dissolve mucilaginous Bodies in Oils, Unguents, and Emplaisters; as in the *Ol. Mucilaginum Ph. Edin. Ung. Dialth. Empl. de Mucilaginibus, Diachyl. mag. cum Gummi, &c.* in all which not one (g) Grain of these Mucilages enters by the Methods laid down in our Dispensatories; because simple Gums and their Mucilages dissolve not in oily Bodies, as I have tried: For, when all the Moisture is (b) evaporated, this Mucilage forms itself into grumous gummy Particles, which afterwards, in straining, are separated and thrown away with the *Fæces*: So that, in the *Ung. Dialthææ*, were the Fenugreek-Seed left out, you would not know that any of the mucilaginous Ingredients had entered that Composition, so little do they impart to it; and yet the predominating Smell of the Fenugreek-Seed is not derived from the *Mucus*, but from the Oil lodged in the Lobes of the Seed: For the *Mucus* of this is also unknowingly rejected with the Sediment, like that of the other Ingredients.

*Of OILY GUMS of Class the second foregoing,
imitated by Art.*

EXPERIMENT I.

TO the foregoing artificial simple Gum, softened with Oil of Tartar, made *per Deliquium*, add a Portion of any essential Oil or Balsam, which, when incorporated,

(g) “ Deinde quia prædicta olea plerumque ex herbis parantur, quarum virtus in mucilaginoso et gummoso succo delitescit, succus autem iste per cocturas in jura trahitur, vel prælo exprimitur, qui vero non maritatur oleis, sed tandem indurefcit fixatus.” *Van Helmont. Pharm. et Dispens. modern. pag. mei libr. 468.*

(b) This is the Rule laid down, by which we are to know when such Compositions are prepared, “ Coque igne lenissimo, aut in B. M. ad humoris aquei consumptionem, assidue agitando, ne empyreuma contrahatur.” *Vid. Ol. Mucag. Ph. Edin.*

incorporated, lay by to be hardened by the Air, and you will have a Substance not unlike an oily Gum, dissolving like the natural in Water, by Trituration, into an Emulsion, or lactescent Liquor.

It may be thought that the Oil of Tartar must have prevented this Mixture from hardening, but I did not find it so.

EXP. II.

As it may be objected, that there can be no Oil of Tartar in the natural oily Gums, I made a Trial with a natural Soap, that is, *Honey*, and it produced much the same Appearances.

It may be still objected, that, tho' Honey be a natural vegetable Soap, repositied for some time in an Animal, it cannot be supposed to be an Ingredient in the natural oily Gums:—The Reader is to consider, that it is used here only as a natural vegetable Soap, which Oil of Tartar is not allowed to be; instead of which I might have used Sugar, Manna, &c. because we are assured, by the best Writers, that it is something saponaceous, inherent in all Vegetables, for this and other Purposes, that is the Cause of this Union: But, as I do not find it fairly proved by any of these Writers, that this Union is occasioned by these means, I proceeded in these Trials upon another Principle.

EXP. III.

Therefore I took of the above Mucilage, inspissated to the Consistence of a softer Gum, and blended it with a Portion of a vegetable Balsam, which was common Turpentine, or the Balsam of the wild Pine. This was laid by, to harden to the Consistence of an oily Gum, which dissolved by Trituration in Water into a neat smooth Emulsion, without the Mediation of an additional soapy Body, as the Process shews.

From whence it appears this Union was occasioned by the Mucilage, assisted by Motion, or (*i*) *Agitation* only; one of the Causes assigned by Dr. *Grew* of Mixture. This Experiment contradicts the Doctrine of all the *Chemical* Writers I have met with on this Head, as well as extemporaneous Practice; for, where an Union of such Bodies is required, it is always accomplished by the Intervention of some soapy Body.

But, to render this Experiment unexceptionable, because the Mucilage here used was from an Infusion of the whole Substances of the Vegetables from whence it was taken, by which means that native Soap, supposed to be lodged, as is already observed, in all Vegetables, might also be dissolved with the Mucilage, and so be the Cause of this Union, I made this Trial in a yet more simple Manner.

EXP. IV.

I took the simplest of all Gums, *Gum Arabic*. this I dissolved in Water, to the Consistence of a thick Mucilage, and with this made an Union likewise of this natural Balsam with Water, as in the former Experiment.

By this Process we learn, that the lactescent Juices of Vegetables, of which our oily Gums are formed,
are

(*i*) *Grew*, of the Causes of Mixture, §. 6. where he assigns Six, of which one is *Agitation*: And is it not from this Motion occasioned by Heat, that Part of the essential Oils, rising in Distillation from aromatic Plants, is so blended with their distilled Water, as to be the sole Cause of the Virtues of these Waters? In these not even a Mucilage can be suspected for helping this Union; unless it can be proved that Mucilages rise in Distillation. Dr. *Freind* says on this Head, “*Ignis quippe particulæ non modo salium cohærentiam intercidunt et dirimunt, sed aquæ etiam momentum intendunt, ita ut ei quasi in subsidiis sint, idem de motu quo- cunque et Agitatione dicendum est.*” *Freind de digestionis in Prælect. Chem.*

are probably compounded (*k*) of two Bodies only, very remote in their Natures, that is, a simple Gum, and a Balsam, without any saponaceous Body to unite them, but rather that this Union has been accomplished by some natural *Agitation* in the Vegetable from whence they are taken, to which our Motion used in this Process may be similar: Whether this natural Motion may be occasioned by the Warmth of the Summer-Sun, or Force of the Winds shaking the Trees and Plants, or perhaps from both together, assisted by some additional Causes of Motion unknown to me, whether Attraction, &c. is not very material to be known here; all which will appear more probable from the following Trials, as far as can be concluded from Experiments made only on one of the oily Gums.

We also learn from hence the probable Cause of Emulsions, from Almonds, the cold Seeds, Poppy-Seeds, &c. that they arise from the Mucilage of these Bodies having been beaten out, and dissolved in the watry *Menstruum* used, with which their Oil also is conveyed and suspended in minute Globules thro' that Fluid: But, as the Oils of these Bodies are of a different Nature from the others, it may be pertinent to inquire how far this also is probable by Experiment.

EXP. V.

To a thick Mucilage or Solution of *Gum Arabic*. was added some Oil of Almonds, which, by *Agitation* only, mixed also with common Water, in the Form of an Emulsion, not readily to be distinguished from

(*k*) Dr. Grew supposes it a volatile Salt, as is already mentioned.

See Boerhaav. de Saponibus (Elem. Chem.)

Dr. Grew tells us he made an oily Gum of the Texture of *Ammoniacum* or *Galbanum*, of a certain Powder and saline Liquor, but most ungenerously conceals the proper Names of the Ingredients. *Of the Power and Use of Mixture, Instance 2. §. 5.*

from that made in the ordinary Way : In this the Mucilage of the *Gum Arabic*. does probably answer more effectually all the Ends of the *Decoctum Hordei* ordered in the other. This Experiment and the former shew the probable Causes of Mixture in such heterogeneous Bodies as the oily Gums and Emulsions from the cold Seeds, &c. which, as I have already mentioned, have had other Causes assigned them by the greatest Writers. For it has not, I believe, been suspected, that this Union of Oils, both essential and expressed, with Water, could be accomplished in this Manner.

*Of VEGETABLE BALSAMS and RESINS,
of Class the third foregoing, imitated by Art.*

EXPERIMENT I.

TAKE the Balsam of the Pine-Tree, that is, common Turpentine, distil it in a Copper *Vesica* with its Serpentine and Refrigeratory, adding a proper Quantity of Water, and you will have its essential Oil, that is, common Oil of Turpentine.

EXP. II.

Distil this thin Oil in a glass Retort with its proper Receiver, till Four Fifths come over, or thereabouts, and there will remain a red thicken'd Oil or Balsam; in the Receiver will be a rectified Oil of Turpentine, falsely called by Artists its ethereal Oil; at the Bottom of which, upon settling, is found a Portion of acid Phlegm, called the true chemical Spirit of Turpentine by Authors.

EXP. III

Protract the foregoing Distillation, changing the Receiver, and this Balsam becomes a Resin, emitting
more

more acid Phlegm and Oil, of which *Hoffman* says, “ Acetum etiam ex Terebinthina per distillationem elicetur, postquam oleum acceperis, Colophonia subsidente, quæ etiam per retortam destillata in acidum abit liquorem.” *Manget. Mess. Medic. Spagyric. p. 527.*

This Acid in Resins first induced the Chemists to imitate them, by adding mineral Acids to essential Oils and Balsams.

By these Three (*l*) Processes we find the Progress that Nature makes in forming Resins, that they are at first essential Oils, that is, thinner Balsams; and, lastly, by Heat evaporating the finer Parts, and the Winter's Cold superinduced, they become Resins; as is the Case in the Pines and Firs, and other Evergreens, whose Balsams, being fluid in the Summer, lose of that Fluidity in the Winter: An Instance of which we have in common Frankincense (falsely so called), or the Resin of the Pine-Tree, when compared to its own Balsam, that is, common Turpentine: Therefore it is less accurate to call Balsams liquid Resins, as we find it in some Authors; for that would be inverting the Order of Nature, as if she began with Resins, and ended with liquid Balsams; since it appears very probable, that Resins are but indurated Balsams, made so by Evaporation, and not by their innate Acid.

And that Balsams are essential Oils inspissated, it will be proper here to observe, upon what was just now hinted, that some Writers of the greatest Repute (*m*) have attempted to imitate vegetable Resins, by adding mineral Acids to essential Oils, justly observing,

(*l*) See *Boerhaav. Proces. de Terebinth. et Element. Chem. Tom. 1. p. 61. et ibidem de Oleis essential.*

(*m*) *Fred. Hoffm. Obs. Ph. Ch. p. 55, et 58. Grew of the Power of Mixture, Instance 2. ff. 4.*

ſerving, that One Part of moſt or all Refins is an Acid, but improperly imputing the Quality of becoming Refins to that Acid ; and were it ſo, that the Acid was the Cauſe, they ſhould have diſtinguiſhed between the Acid of Vegetables, ſuch as riſes in the Diſtillation of (n) Turpentine, and between that of Minerals, ſuch as that Acid is ſuppoſed to be, which riſes in the Diſtillation of Amber, &c. — For, in this reſpect, if not in others, we may believe, from Experiment, that the vegetable and foſſile Refins and Balfams do remarkably differ: Therefore mineral Acids, joined to eſſential vegetable Oils and Balfams, muſt produce a Subſtance in their Nature rather like the foſſile than the vegetable Refins or Balfams, as will appear in the next Claſs.

*Of FOSSILE BALSAMS and RESINS, of
Class the Fourth foregoing, imitated by Art.*

EXPERIMENT I.

TAKE Oil of Turpentine Four Parts, Oil of Vi-
triol One Part ; mix them well in a glaſs Mortar,
and they will inſtantly form a thick red Balfam,
which by Evaporation will become a Refin, reſem-
bling, in ſome reſpects, a foſſile Balfam (o) or Re-
fin :

(n) “ In eo acidus ſemper adest ſpiritus putredinis antidotos.”
Boerhaav. Proceſſ. 60. Tom. I.

“ Acetum etiam ex Terebinth. per deſtillationem elicitur, &c.”
Manget. Meſſ. Med. Spagy. p. 527, in notis.

Yet *Malpighi* calls this Sourneſs, when powerful in ſome Ve-
getables, a Vitriol (but it muſt be in a figurative Senſe) from
their intense acid Taſte, of which we find an Inſtance in the Huſk
of our common Hazel-nut ; his Words are, “ Frequentius tamen
“ pericarpium caro multo vitriolo ſcatet.” *Malpighi Anatome plan-
tarum, in folio, p. 74.*

(o) “ Hinc Bituminis ſulphurisque artificioſa confeſſio cognos-
“ citur.” *Boerhaav. Proceſſ. 160. Sulph. ex oleo & acido con-
feſt.*

fin: For, when first made, it smells bituminous, somewhat like Oil of Petre; but, when macerated for some Days, this Smell alters into that of burning Brimstone; and, according to the best Writers, will, in Distillation, afford true mineral Flowers of Sulphur. It is to be observed, that when this Mixture is first made, it will readily dissolve in *Alcohol Vini*, because the Union of the mineral Acid with the Oil is not at that time strict enough to prevent the Dissolution; but, after Maceration for a proper Time, the Union becomes so strong and intimate, as not only to put on the Nature of a fossile (p) Balsam, by yielding little of its Substance in *Alcohol Vini*, but also smelling like, and affording, a true *Flos Sulphuris*, as is already observed; so that this Experiment is deceitful, if not properly handled; and perhaps a Neglect of this previous Maceration, found so necessary to incorporate these Bodies properly, was the Reason why *Hoffman* (q) missed in producing Flowers of Sulphur, whilst other Authors (r) succeeded. This Want of Maceration appears to be the Reason also, why the Resin (s) he formed from Oil of Lavender and *Aqua fortis* did dissolve in *Alcohol Vini*; for, had the Union been strictly made, it would, probably, be as indissoluble as ours with Oil of Vitriol, &c.

Geoffroy tells us it must be “post lenem, sed diu-
“turnam, digestionem.” *Introduct. ad Mater. med.*
And *Dr. Boerhaave*, that it must be digested for
Eight Days.

EXP.

(p) “Tandem evadit piceum, bituminosum. Liqueor prodeunte
“fœtore suffocante sulphureo formidabilis pulmoni est,—tandem
“in fine sulphur verum in collum retortæ ascendit.” *Ibid. Pro-*
cess. 160.

See *Mang. Mess. med. Spagyr. sub finem, in notis*, p. 527 de sulph.

(q) “Tamen felicem successum obtinere non potui.” *Hoff,*
Obs. Ph. Ch. p. 279.

(r) *Boerhaav. Geoffroy, Mr. Boyle, &c.*

(s) *Hoff. Obs. Ph. Ch.* p. 55.

EXP. II.

I repeated this Experiment with Spirit of Vitriol, but it produced not the Effects of the former with Oil of Vitriol ; particularly its Indissolubleness in *Alcohol Vini*, because of the Weakness of the Acid, which is to be remarked ; for, from this Principle, we may account for an Appearance often observed, but not regarded, in the preparing one particular Medicine, according to the *London Pharmacopæia* ; that is, the *Elixir Vitrioli* ; which Composition, after it has been a proper Time made, lets fall a Sediment, the Consequence of a *Coagulum*. As this Medicine is the Result of Two limpid Bodies, this Sediment must be Part of the Substances that had been dissolved ; that is, the aromatic Resin or Balsam taken from the Ingredients by the Spirit of Wine ; which loses its Property of continuing dissolved in that *Menstruum*, because of the strict Union of the Oil of Vitriol with it ; which, as is above proved, hinders vegetable Balsams from thoroughly uniting with strong Spirits of Wine. And this I confirmed, by a Trial on this Sediment, which, after all the tasteable Acid was washed out of it, would not dissolve again in *Alcohol Vini*, more than Amber, &c. Therefore we may conclude this *Elixir* to be little better for its aromatic Ingredients ; and that the Alteration in the *Edinburgh Pharmacopæia* is an Improvement, where they order Spirit of Vitriol instead of its Oil, from whence no Precipitation may be feared ; that Acid being too weak to destroy the soluble Quality of the aromatic Balsam or Resin of the Ingredients, and yet strong enough to produce the medicinal Effects desired from the other ; for both must be diluted in a proper Quantity of Fluid, before they can be taken into the Stomach.

EXP. III.

Take Oil of Turpentine, and, by Evaporation only, make it a Balsam, according to a foregoing Experiment II. of CLASS III.

EXP. IV.

Take also Oil of Turpentine, made into a Balsam by means of a mineral Acid well united, according to Exp. I. of this last Class.

EXP. V.

Add a Portion of each of these foregoing Balsams to separate Portions of rectify'd Spirits of Wine, and the Balsam of Turpentine made by Evaporation only will readily dissolve in it, like the natural Balsam, that is, common Turpentine; whilst the other Balsam, made from Oil of Turpentine and the mineral Acid, will not dissolve more than fossile Balsams and Resins usually do; *v. g.* like Amber.

It appears from the Whole, that simple Gums are but Mucilages inspissated.

That Gum-Resins are compound Gums; that is, inspissated Mucilages blended with Oils or Balsams; and therefore are more properly called, by some Authors, oily Gums, than Gum-Resins.

That all Resins, both vegetable and fossile, have been Balsams, and probably Oils.

That one distinguishing Characteristic of the vegetable Resins and Balsams is their Solubleness in *Alcohol Vini*, on account of their weak vegetable Acid.

That of the fossile Resins and Balsams is the Difficulty of dissolving them in the same *Menstruum*; or rather their Indissolubleness, when compared to the vegetable, occasioned probably by their mineral Acid; therefore, that vegetable Resins cannot be imitated,

(t) imitated, by adding mineral Acids to essential vegetable Oils, according to *Hoffman, Grew, &c.*

How far these vegetable Balfams and Resins may differ from the natural fossile, and these natural fossile from the artificial, in other respects, is left to farther Trials: These suffice to shew, that vegetable Resins cannot be made by mineral Acids joined with vegetable Oils. But, if Acids are so essential in the Composition of these Bodies, when formed by Nature, how improper is it to attempt to destroy that Acid, by means of alkalious Salts, and other antiacid Bodies! as is the Case in making Tinctures of several of them, by first opening their Texture, as it is expressed, by the alkaline Salt of Tartar, according to the Doctrine of the best Writers, as will appear hereafter.

As the Classes first proposed are now settled, and the Principles on which that Division was made explained, it now remains that we enter upon the Experiments on the Simples proposed, in order to know to which of these Classes they belong; and, by that means, how to treat them in Pharmacy with Safety to their Virtues. And, first,

(t) “Attamen est ratio dubitandi an quidem coagulo olei per acidum id contingat, &c. &c.” *Boerhaav. Element. Ch. Tom. 2. p. 242.*

C H A P. IV.

Of MYRRH.

GOOD *Myrrh* should be *friable, light, fat*, on the Outside of a *brown Red*, inwardly shewing *white Lines, with Spots*, like those on the Nails of the Hand, *tasting bitter, acrid*, and of a *grateful Smell*.

That which is *weighty*, of a *disagreeable Smell*, and of a *pitchy Appearance*, is bad.

By some Authors Acrimony is joined to the Character of bad *Myrrh*; but they were not sufficiently acquainted with *Dioscorides's* Account of it, who tells us otherwise; and which indeed may be learned by tasting our present *Myrrh*.

EXPERIMENT I.

Take highest rectify'd Spirit of Malt, made so by an (a) alkaline Salt; in Part of this macerate (b) powder'd *Myrrh* for some Days, hastening the Solution by *Agitation*, not Heat (c); and it will afford a Tincture well impregnated with the Balsam of the *Myrrh*.

EXP.

(a) *Hoff. Obs. Ph. Ch. p. 87. qua docetur separatio omnis phlegmatis a spiritu sine igne.*

(b) By Maceration is here meant cold Infusion, to distinguish it from Digestion, which is always attended with Heat.

(c) “ Si quis corporum balsamicorum vires, quas indigenas possident, salvas ac integras servare atque ad medendi usum transferre velit, igne acriori hæc ipsa minime exercenda ac torquenda.” *Hoff. Obs. Ph. Ch. p. 59.*

And lower down, “ Præstat itaque citra texturæ per ignem destructionem ipsa balsama aut resinas aptissimo menstruo dissolvere.” *Ibid.*

EXP. II.

In the like Quantity of the same Spirit, but with the Addition of an alkaline Salt in Substance, macerate the same Portion of the same sort of powder'd *Myrrh*, for the same Space of Time, urging the Solution, as in the foregoing Experiment; and it will produce a Tincture impregnated *apparently* like that.

EXP. III.

But take of each of these Tinctures One Teaspoonful, and pour them separately into Two distinct but equal Portions of River-Water; the first, without the alkaline Salt in Substance, will render the Water very milky, tasting strong of the *Myrrh* (if the Quantity of Water used be not great); whilst the last with the alkaline Salt will make the Water of but a dilute Milkiness, tasting much weaker of the *Myrrh*.

EXP. IV.

Make the like Trials with common rectify'd Spirits of Malt, in which there is always a remarkable Portion of Phlegm, in Comparison with *Alcohol*, or the highest rectify'd Spirits.

The first without an alkaline Salt made the Water very milky, little different from the foregoing Tincture made with *Alcohol*; whilst this with the alkaline Salt scarce muddied the Water.

Here we find, that the alkaline Salt seemed to hinder the Solution of the *Myrrh* in both Trials; the Reason of which will appear in some following Remarks.

EXP. V.

Make the same Trial with a Tincture of *Myrrh*, prepared according to the *London Dispensatory*, with
Oil

Oil of Tartar ; which, tho' to the Eye it seems more highly impregnated than any of the foregoing, yet will alter the Water's Appearance less than any, and make it taste weaker also than any.

EXP. VI.

Macerate *Myrrh* in Brandy, and it will afford a deep Tincture ; which, mixed with Water in the above Proportions, alters the Colour very little ; but increased, renders it turbid.

In this Process a great Portion of the *Myrrh* was left undissolved.

EXP. VII.

Dilute the foregoing Tincture of *Myrrh* made with Brandy, with such a Proportion of Water, as will bring it to the Standard of a Julap ; and you may then totally dissolve the Remainder of the *Myrrh*, not into a Tincture, or limpid Solution, but one more congruous to its Texture, a lactescent Solution or Emulsion. This must be done by Trituration, not Boiling or Maceration.

EXP. VIII.

Macerate *Myrrh* in rectify'd Spirit of Malt alone, with repeated Affusions of new Spirit, till it will extract no more.

Take the *Residuum* of these Tinctures, and boil it in common Water, and it will intirely dissolve into a limpid, brown, mucilaginous Decoction somewhat rough on the Palate, except a small Sediment. This Roughness may be occasioned by some Parts of the Bark of the Tree from whence this Gum flowed, concealed in the Sediment, which did not dissolve, and appeared to be mere Dirt. By these last Experiments we learn what this Simple is ; that it is a mere oily Gum, made up, as they are, of two opposite Substances ; a simple Mucilage dissolvable
in

in Water only, and a Balsam dissolvable in proper sulphureous *Menstruums*, and therefore may be reduced to the (*d*) second Class, or oily Gums, before-mentioned.

The Analysis of this Gum (*e*) agrees so far with our artificial oily Gums, that, from the Experiments on both, this Induction may be brought, that the natural oily Gums, or Gum-Resins, are probably so compounded; which seems to be proved by these Experiments, as far as their Nature will admit of.

EXP. IX.

Boil plain powdered *Myrrh* in Water for some time, and it will swell, and render the Water turbid; but, when cold, its greater Part will subside, and continue undissolved, with a Loss, probably, of the finer Parts of its Balsam by Evaporation.

EXP.

(*d*) This agrees with *Angelus Sala's* Account of the ferulaceous Gums; “*Hæc pars viscosa est sine sulphuris participatione, in aqua solubilis exsiccata, haud difficulter in pulverem teritur, ignique admota flammam minime concipit, ac per omnia ad modum Gummi Ceraforum, Pomorum, aut Arabici se habet.*” *Ang. Sala Essent. veget. anatom. Sect. 6. Cap. 5.*

Yet if you burn Gum *Arabic*. you may see a Flame dart from it, as if there were some small Portion of Oil in it; but here it is meant, as I suppose, comparatively; in which Sense I have considered simple Gums.

And again the same Author says, “*Gummi Ammoniac. Affa fetida, &c. duplicem substantiam complectuntur, unam resinofam, ponderosam, in aqua subsidentem*” (this I have observed in a Solution of *Myrrh* in Water, that some of its rich Balsam will subside, and, on shaking, seem to re-unite: 'Tis probable, if a large Portion of common Turpentine was added to Gum *Arabic*. dissolved, in making the artificial compound Gums in this Treatise, that Part of it would also subside) “*alteram mucaginis, aut Gummi Ceraforum, soluta instar aquæ miscibilem.*” *Ibid. de Ammon. et alior. ferulaceorum gummatum purificatione, Sect. 6. Cap. 4.*

(*e*) “*Ex gummatibus vero resinosis Myrrha, &c. pars tantum sulphurea et oleosa extrahitur.*” *Hoff. Obs. Ph. Chem. p. 59.* From whence we may justly rank *Myrrh* among the Gum-Resins, or oily Gums; such as *Ammoniac. Galbanum* (in Tears) *Opopanax*, &c.

EXP. X.

But, beat *Myrrh* in a Mortar with Water (which I have considered as analogous to the *Agitation* that formed this Substance; and united the Parts into a lactescent Juice; when in the Parent-Plant), and it will readily dissolve into an Emulsion, agreeable to Exp. 7. of this Chapter; which it would not do by boiling. It also suffers nothing from Heat, by this Manner of Treatment; which, in the foregoing Experiment, must injure it, as is already mentioned.

All *Emulsions* are but imperfect Solutions; yet agreeable to the Texture of some Bodies, which will admit of no other Solution: For the dissolving one of the Principles of a Body into a Tincture, and rejecting the rest, is not a total Solution of that Body. And this must be the Reason that *Vigani*, on the *Elixir Proprietatis*, says of *Myrrh*, “ Nam experientia instructus affirmo, ne granum *Myrrhæ* a communi operandi modo vere dissolvi, nisi prius præparetur. Et hæc sit una ratio, quare vulgaria *Elixiria* non producant tanta miracula, quanta expectari debentur.” *Vigani Medull. Chem. p. 38.* Or else this Author has asserted an Untruth; because the Balsam of *Myrrh* readily dissolves in strong Spirits of Wine; which every one must know, that has ever mixed them; but, to dissolve the whole Concrete, is to make an Emulsion of it; because it is so compounded by Nature, as not to admit of a Tincture from a Solution of its whole Body: For, as sulphureous *Menstruums* will only dissolve the Balsam (by Exp. 8. of this Chapter, where the gummy Part is rejected), so watry *Menstruums* only dissolve the Mucilage intirely (by the same Experiment); which Mucilage, whilst dissolving in the Water by Trituration, carries along with it the Balsam or Oil; which, being suspended only, not dissolved, renders the Fluid opaque (as in Exp. 4. of the Chapter on *Artificial Gums*).

Gums). But sulphureous *Menstruums*, when they dissolve the Oil or Balsams of these Gums, they do not also suspend the Mucilage along with it in the Fluid ; or else this Solution would be turbid, as the watry Solution.

And does not Nature point out this *Menstruum* (Water) to us? Was it not Water that first dissolved these oily Gums in their Parent-Plants, in the Form of an Emulsion, as is seen in the milky Juices of Plants? And should not Water restore them to their former fluid State? Therefore limpid Solutions, or Tinctures of the oily Gums, may be suspected for having less of the Properties of those oily Gums, than their turbid Solutions or Emulsions ; unless it can be proved, that their Virtues depend on Part of their Substances only, and not on an Union of the Whole.

I have been assured, that a Solution of *Myrrh* made in Claret-Wine, upon this Principle, and applied afterwards as an external vulnerary Medicine, produced such salutary Effects, as were much superior to, and also different from, that of a Tincture made with *Myrrh* and strong Spirits of Wine, where the Balsam only is dissolved. And, perhaps, from this Principle the pectoral oily Gums are of such Use ; that is, from their Mucilage joined with their Balsam, as in *Opopanax*, *Olibanum*, *Ammoniacum*, &c. And do not Physicians oftentimes, for this Reason, add *G. Arabic.* to terebinthinated Bodies, to render them more effectual, by preventing some Ills that may arise from them, when given in a mere simple State? As I have known done, in mixing *Gum. Arabic.* with boiled Turpentine, to make the *Pill. de Terebinthina costa* more safe.

In order to make the Inductions from these Experiments unexceptionable, I extended these Trials a little farther. — In some foregoing Processes it appears, that alkaline Salts do hinder the Solution of the Balsam of *Myrrh* ; which contradicts a favourite

Process of Dr. *Boerhaave*, for making a Tincture of this Gum ; of which he is so well satisfied, that he tells us, it so far exceeded others, that *optime succedit* ; and which, upon that account, is so much depended upon, that it is either followed, or imitated, in almost every *Pharmacopœia* written since his Publication.

To know then the Truth of the Excellence of this Manner above others, I prepared a Tincture of *Myrrh*, in all respects (*f*) agreeable to his Directions, except in the Circumstance of (*g*) evaporating the Tincture to a certain Standard after it was extracted ; which I omitted, as not being to our present Purpose ; because my View is only to know the Power of a fixed alkaline Salt on these Occasions ; and with this I prepared another Tincture of plain *Myrrh*, and *Alcohol Vini*, according to a former Experiment.

EXP. XI.

Both these were digested for Twenty-four Hours ; in which they had an equal Share of Heat, as well as an equal Time, for extracting the Tincture.

EXP. XII.

Of each of these Tinctures I took a Tea-spoonful, and poured each into a like Portion of River-Water. The first, of Dr. *Boerhaave*'s Process, rendered the Water of a dilute Emulsion-Colour, as if weakly impregnated :

(*f*) Vid. *Tinct. Myrrh. juxta formul. Boerhaav.*

(*g*) If I had evaporated Dr. *Boerhaave*'s Tincture, according to his Standard, I must have evaporated this ; so that they would have been equal ; and as I have omitted it in one, I also omitted it in the other ; therefore they are still equal. It seems much more consistent with the Volatility of these finer Balsams, to load their *Menstruums* well with the Balsam. to be dissolved, and that by the mildest Heat, to prevent Evaporation, than to evaporate a weak Tincture half away, in order to make it the stronger.

impregnated : The other, from plain *Myrrh* only, and *Alcohol Vini*, rendered the Water of a saturated Emulsion-Colour, as if highly impregnated, and seemed in Taste also to be stronger of the *Myrrh* than the other. — These Tinctures being laid by, and the same Trials repeated some Months after, but in larger Portions of Water, the simple Tincture, or that without Salt of Tartar, then by far exceeded the other in Strength, which was made with Salt of Tartar.

I repeated these Trials frequently, in order to be certain of this great Difference ; but found a considerable Disparity between Pump or Spring-Water, and River-Water ; for the weaker Tincture, which made the Water of but a dilute Milkiness, upon repeating the Trial with Pump-Water, made it as milky, nearly, as the stronger or simple Tincture. Seeing this, I was put upon an Enquiry into the Cause of it ; which occasioned the following Experiment.

E X P. XIII.

To a Mixture of Pipe or River-Water, and this weaker Tincture of Dr. *Boerhaave* (which turned the Water less milky) were added a few Drops of a mineral Acid (that is, Spirit of Vitriol) ; upon which the Mixture grew much more milky, approaching near to the other with the simple Tincture and River-Water : For the Acid of the Vitriol destroying the *Alkali*, which had concealed the Oil or Balsam, the milky Appearance revived. — Thus it happened to the Mixture with Pump or Spring-Water ; Spring-Water most commonly having some mineral Salt in it, in which Salt there is a latent mineral Acid, one of the constituent Parts of most fossile Salts, which acted like Spirit of Vitriol on the alkaline Salt of Dr. *Boerhaave*'s Tincture, by which its Milkiness revived, it was still less so, and tasted less of the *Myrrh*, than the other.

From

From these Experiments we find, an alkaline Salt is no Improvement to that elaborate Process of Dr. *Boerhaave*, but rather an Injury; in which the *Myrrh* must suffer also by the repeated Evaporation of the Phlegm, attracted by the Salt of Tartar, as may be observed in reading the Process; for the mildest Heat must dissipate some of the finer Parts of this Gum, during Evaporation, by which the Balsam of *Myrrh* must suffer; the only Part this *Menstruum* can dissolve, notwithstanding all the Endeavours to do more, that is, to dissolve it intirely in *Alcohol Vini*. And, indeed, if such an Heat, as Sir *Isaac Newton* observes (*b*), be necessary to separate Water attracted by Salt of Tartar, the Loss should be very great. For this Reason, I suppose, in the *Edinburgh Pharmacopæia*, the Evaporation is wisely ordered but once, in the Preparation of *Myrrh* for its *Menstruum*.

By these Experiments it appears, that the more elaborate Parts of this tedious Process of Dr. *Boerhaave* are injurious to the Medicine, instead of improving it.

EXP. XIV.

Take common rectify'd Spirit of Malt or Wine; add a Portion of some highly alkaline fixed Salt, well dried, to it; and in a few Days the Salt will attract from the Spirits such a Portion of Phlegm, as will make it a mere Oil of Tartar, in Appearance; which Phlegm does so unite with the Salt, as to remain at the Bottom of the Spirits immiscible, like Water at the Bottom of Oil.

You

(*b*) And whence is it (says Sir *Isaac Newton*), but from this attractive Power, that Water, which alone distils with a gentle lukewarm Heat, will not distil from Salt of Tartar, without a great Heat? *Newton's Q. 31.*

You will know when this Salt has attracted the Quantity of Phlegm necessary for this Experiment, by Part of it appearing undissolved, as if no more Phlegm was left in the Spirit for the Salt to attract; by which means this Spirit becomes a true *Alcohol*. See *Hoff. Obs. Ph. ch. p. 87*.

To this Spirit, with its ponderous Oil of Tartar at Bottom, add a Portion of powdered *Myrrh*, and digest them; by which means you will find the *Myrrh* unite with the Oil of Tartar, and become soft; the powdered Particles coalescing again into a Mass, from the Phlegm attracted by the Salt of Tartar. This is the Reason that the Salt of Tartar prevented the Solution of the *Myrrh* in the above Experiments; that is, by so softening, and by that means again uniting, the divided Particles of the powdered Gum, that the Spirit could not penetrate it, to dissolve its Balsam; the Part only dissolvable by that *Menstruum*.

EXP. XV.

But if you digest the same Quantity of *Myrrh* in the same Quantity of the above rectify'd Spirits, before the alkaline Salt be added, it will extract all the Balsam of the *Myrrh*, by penetrating its Substance intimately (its Parts continuing divided in the *Menstruum* in Powder, as when first put in): For no Inconvenience arises to it from the small Portion of Phlegm diffused thro' the *Menstruum*; there being no such Attraction in *Myrrh*, as in Salt of Tartar, to call the Particles of Phlegm, dispersed equally thro' the *Menstruum*, to itself, and there retain them, as in the above Experiment. This explains to us, why the Tinctures of *Exp. 4.* of this Chapter differed so much in Strength.

EXP. XVI.

If to the rectify'd Spirit of Malt, floating over the Oil of Tartar (as in *Exp.* 14. by which Process, the Oil of Tartar being separated from it, this Spirit becomes a (*i*) *sincerum Alcohol*, according to the *Chemists* Doctrine, as if all its Phlegm was extracted), you again add more of an highly fixed alkaline Salt, and digest them a considerable time, the Salt will attract more Phlegm; insomuch that if this Trial be repeated often, it will, according to the Opinion of the most (*k*) Accurate, turn a great Quantity of the Spirit into Water; which makes the Appearance of a Salt undissolved at the Bottom of the Spirits (when done by Maceration and Agitation, instead of Heat, as by *Exp.* 14.) no certain Rule that it has attracted all the Phlegm; tho' it has done what the Chemists require (according to *Exp.* 1. and 2. of this Chapter).

This Experiment shews, that, with the other Inconveniences attending the before-mentioned Process of Dr. *Boerhaave*, it has this also; That, tho' he uses this *sincerum Alcohol*, which, as he thinks, is sufficiently void of Phlegm, yet, by the Addition of more alkaline Salt, in the Dissolution of the *Myrrh*, to this true *Alcohol*, fresh Phlegm will still be attracted from the *Menstruum* by the Salt; which, as I have tried, softens the Gum in this also, as in a foregoing Experiment, so that the *Menstruum* cannot penetrate it sufficiently to come at all its Balsam.

These

(*i*) *Vid.* *Boerhaav. Elem. Chem.* on this Head, and *Hoff. Obs. Ph. Ch.*

(*k*) For Spirit of Wine is inflammable by means of its oily Parts; and, being distilled often from Salt of Tartar, grows by every Distillation more and more aqueous. *Newton's Optic.* p. 250.

These Two last Experiments explain to us why the Tinctures of *Exp.* 3. and 12. differed so remarkably in Strength.

I hope these Proofs will acquit me, in presuming to oppose the chemical Doctrine of so great a Writer, as the Author of the Process here objected to is allowed to be.

From the foregoing Trials we have learned the Texture of *Myrrh*, and the Absurdity in using fixed alkaline Salts to dissolve it; which not only hinder the Solution, but destroy the innate Acid; one of its Principles supposed to contribute to its (1) medicinal Effects: The Impracticability of making a limpid Solution, or Tincture of its whole Substance: The Difference that must be, as a Medicine, between its Tincture, and a watry Solution of it, or Emulsion. By which last Process we have a new *Formula* to add to the Inventory of Medicine; that is, *Lac myrrhatum*. We may learn also, from these Trials, how to treat this Gum, as well as the rest of its Class, that is, all oily Gums, more rationally than is customary, in several Compositions which they enter in our *Pharmacopæia's*.

Some Critics make it the Test of rightly prepared Tincture of *Myrrh*, that it turns Water milky; which, if made honestly, according to the Rules of our *Dispensatory* (I do not mean that just now published), it will not do, when mixed in the above Proportions in Water, because of the Oil of Tartar used in that Preparation of it: Therefore People of Integrity, who prepare these Medicines, have lain under an Imputation of Ignorance, because they have kept none other for Sale, but what was truly prepared; whilst the disqualified of that Profession have gained Credit, by erring into Right; who take no other
Trouble

(1) "In eo acidus semper adest spiritus putredinis antidotos."
Boerhaav. Prae. 60.

Trouble to make this Tincture, than in the simple Manner above directed (in *Exp.* 4. of this Chapter), without a fixed alkaline Salt,

The Knowledge of the Texture of this Gum leads us into an Enquiry of its famed antiseptic Qualities. The Balsam of *Myrrh* indeed may be antiseptic, when separated from the Gum, because all Balsams are so. Every Anatomist knows this Quality in Turpentine, or its Oil, in preserving Bodies from the Influence of the external Air; and an Addition of *Alcohol Vini* to these Balsams, as in the Tincture of *Myrrh*, may improve that Quality: For animal Bodies may be preserved from Corruption, in either the Spirit of Wine, or Balsam, alone; which, when joined, may therefore be the stronger Preservative. But that *Myrrh*, in its natural State, where this Balsam is joined with a Mucilage, which will dissolve in Water like *Gum. Arabic.* should have that Power, more than other oily Gums, does not appear. But if it should, upon Trial, turn out to be so, we have Reason to believe it is not peculiar to *Myrrh*, but common to all Bodies so compounded by Nature; that is, to all oily Gums, or Gum-Resins.

We may now enquire, what Authority there is from History to pronounce this Gum an Antiseptic. *Dioscorides* knew nothing of this Quality in it: *Helmont*, a modern Author, speaks confidently of it; but upon what Foundation we may learn from his own Words, when he speaks of the *Egyptian* Mummies: “Aromaticum et unguentorum pinguedine adeo condensantur, ut in modum picis induratae resplendeant—quantum narium judicio colligi potest, *Myrrhæ* multum his unguentis admisceri debuit.” *Helmont de Febr. c. 2.* But this is of no Weight; for his Sense of Smelling might have deceived him; or, had he been sure it was an Ingredient in their embalming *Sparadraps* and Unguents, it is no Authority; for, unless it be used alone, the Trial cannot be conclusive.

Dr.

Dr. *Boerhaave* tells us, it is *sumum Antisepticum* ; but he says this in his Conclusions on a Process where *Alcohol Vini* has the greatest Share in extracting its Properties ; which, as I have proved in the foregoing Experiments, is nothing but the Balsam : But, if he means the whole Substance, I fear we must doubt of the Truth of it, because of the Nature of its Composition ; or assign the same Properties to all the oily Gums.

The Question that now remains is, Whether our *Myrrh*, and what these Authors used, be the same. That our *Myrrh*, and Dr. *Boerhaave*'s, and even *Helmont*'s, are the same, is not to be doubted, from the Nearness of Time to each other ; and that ours is the same of *Dioscorides*, is very probable, from an Author of good Credit on this Head, M. *Geoffroy*, who tells us, that the several Sorts of *Myrrh*, mentioned in History, come all mixed together ; which must be the Reason, says he, we meet with Pieces somewhat differing in their Colour, Consistence, and Strength of Smell. *Geoff. Traët. de Mater. med. de Myrrha.*

Suppose then, that these Objections to its antiseptic Qualities are of no Weight, and that its universal Character be true, but, particularly, that of *Helmont*, who tells us, if this Drug could get a (*m*) Passage to our inmost Vitals, it would contribute to long Life : And this perhaps from a Principle he shews in another Place ; “ *Myrrha* enim jam a bis mille annis, “ *cadavera Memphitica præservat.*” *Helm. de Feb. c. 2.* Which he asserts as confidently, as if he had been present at their Preparations for Embalming so many Hundred Years ago, and had seen nothing but *Myrrh* used at that time in those Preparations.

But

(*m*) “ *Nam ut Myrrha mumiam custodit a putriendi aptitudine, si Myrrhæ aditus ad nostri constitutiva detur, non erit “ cassa Myrrhæ ad vitam longam auctoritas.*” *Van Helmont. Arc. Paracels.*

But to return ; if it should have these Effects, upon Condition that it could find a free Passage to our inmost Vitals, here is a Method pointed out in these Experiments, the *Lac myrrbatum*, or *Myrrh* reduced into an Emulsion, a Form delineated by Nature, for making a speedy Passage, resembling *Chyle* : And now it is known, let us attend to its Effects, which have been so much talked of, yet, perhaps, never sufficiently proved.

We learn, from these Experiments also, why the White of an Egg, properly (n) prepared, has been reckoned the only Dissolvent of *Myrrh*. For, when so prepared, it runs into Water ; and, as such, probably, acts on the gummy or mucilaginous Parts of this Simple.

Geoffroy, finding that the White of an Egg dissolved *Olibanum*, as it did *Myrrh*, remarks it : But it is because he takes *Olibanum* in a wrong Sense ; as he and all Authors I have seen do *Myrrh*, making it a Resin ; whereas it is an oily Gum, like *Myrrh*, dissolvable in Water, and therefore dissolvable in the White of an Egg, when reduced to Water. From which Principle it is highly probable, that the White of an Egg would act in a like Manner on all the oily Gums.

These Inductions, as they are the Result of Experiment, may, at least, be thought very probable, if they are not certainly proved.

If Water alone can dissolve this Gum, is it not a better *Menstruum*, than that Water loaded with (o) acrid Salts, whose Use is only designed for dissolving

(n) “ R^x ova recentia ad duritiem cocta, q. v. per mediam longitudinem incisus eximantur vitelli. Cavitates albuminum impleantur *Myrrha* in pulverem trita ; conjuncta rursus albumina filo circumdantur, et suspendantur in loco humido, ut liquor seu oleum defluat in vas suppositum.” *Pharm. Edin.*

(o) Dr. *Boerhaave* tells us of his saline *Menstruum*, “ Solvens penetrantissimum, quo *Myrrha* et alia difficiliter solubilia pulcherrime dissolvuntur penetranturque.” *Process. Chem.* 110.

solving (p) the *Myrrh*? If such severe Methods be used for altering the Forms of Medicines, we can never be sure that their Virtues remain unaltered.

(p) The same Author imputes the Solution, where the *Menstruum* is Water, to the Salts dissolved in that Water (*Process* 83.) ; and is so far from imputing the Solution to the Water, that he ranks *Myrrh* among those Bodies, which, he thinks, neither Water nor Spirit will easily dissolve : “ Talia erant
“ *Sang. Draconis, Gum. Juniperi, Gum. Lacca, Myrrha, et alia,*
“ in quibus invenitur mire tenax durities, qua non admittunt
“ partium suarum facilem dissolutionem.” *Pag.* 228.

And in another Place, talking of his *Tartarum regeneratum*, he says, “ In aqua soluti censendum— inter pulcherrima quæ in
“ *Chemia* cognoscuntur menstrua, id discat, qui velit, deco-
“ quendo in hoc medicamine *Gum. Lacca, Myrrham, et similia,*”
P. 265.

C H A P. V.

Of A L O E S.

*A*LOES occurs next in Order ; which is the nutritious Juice, or (a) *Succus proprius vegetabilis* of a Plant of the same Name. Before we set about the Analysis of it, we must enquire which is the true medicinal Kind ; as there are now Three of them commonly known, the Production of different Species, each of which is good ; from these arise many Sorts in Trade, occasioned by Accidents, some of which have befallen them during Importation ; the removing the ill Consequences of which often obliges the Trader to use such Arts to make it fit for Market, as gives it a new Face, by which Change it becomes a new Sort : As, for Instance ; If by chance this Drug should be damaged at Sea, by the letting in of Water, and afterwards should contract Dirt, by means of the Softness acquired thereby, the Method is, to melt it in such an Addition of fresh Water, as will make it readily pass thro' proper Strainers, in order to separate all this adventitious Dirt, and afterwards it is boiled to its original Consistence ; by which Treatment it acquires a new Face, and, of course, becomes another Sort, recommended by the Trader under the Title of a cheaper Sort of *Aloes*.

I speak this from Information, the Truth of which I have Reason to believe ; and therefore it will not be surprising to meet *Aloes* in Trade not answering the Character and Description laid down here ; having confined myself to the Three Sorts arising from them, occasioned by their first Impurities only ; that is, such
Impurities

(a) *Vid. Boerhaave, Elem. Chem.*

Impurities as were exported with them from their native Soil; taking no farther Notice of such as are the Effect of Accidents, acquired on the Way to Market; which are such Variations from their Originals, as should prevent their having any Place in Medicine.

If the Alteration of the Face of this Drug was the only Consequence that attended this apparent Piece of Industry, it would be commendable to depurate it as above; but, as Experience tells us, that the boiling *Aloes* any considerable time lessens its purging Quality, 'tis an Error not to be passed over.

One would imagine, upon reading the History of this, that our common *Barbadoes* was rather the true hepatic and succotorine *Aloes*, used of old, than that which is now called Succotorine. For, by *Fabius Columna's* Account and Description of it, it seems to have been the Kind now vulgarly called *Barbadoes* or *American Aloes*: His Words are,
 “ Color ex citrino, cum concrefcere incipit, ruffef-
 “ cit; atque, concretus, magis nigricat, et obfcure
 “ parum rubentem acquirit colorem, concreti fan-
 “ guinis modo, vel potius hepatis fimillimum, tranf-
 “ lucidus, lævis, odore gravi aromatico, fapore
 “ amaro admodum, ac abhorrendo, et mirum quod
 “ manu tantum attrectanti odore, atque illius vapore,
 “ ut ita dicamus, inficiatur aer, atque guttur ama-
 “ rum reddatur.” *Lib. rar. et min. cogn. ftrip.*
 c. 11.

This *Aloes* the above Author prepared himfelf at *Naples*, and delivered us this Account, as he fays himfelf, “ ut *Aloem* vulgo cognitam veram effe tef-
 “ tificetur.” This Account agrees better with *Diofcorides's* and *Pliny's*, than the Description of the prefent Succotorine delivered to us by Writers, which feem to have no Affinity with theirs. Some Authors of Credit fay, it fhould fmell fweet; which does not feem reconcileable to *gravi aromatico* in the above Account; *gravi* intimating, at leaft, an Allay in its
 aro-

aromatic Smell. From whence we may conclude the Ancients knew more Kinds of *Aloes* than one ; and that they have written of these different Kinds at different Times : But that our present *American* or *Barbadoes Aloes* was once the medicinal, tho' then the Production of another Country, seems also probable, from the following Passage : “ Etiamſi variæ *Aloes* “ ſpecies exiſtunt, quæ ſuccum fundunt amarum, “ harum tamen unica eſt, quæ *Aloes vulgaris* a “ C. B. *Dioſcoridis* a *Fabio Columna*, *Arabica* Succotorina officinarum a *Moriſono* vocatur, et ab omnibus botanicis veram *Aloem* fundens planta exiſtimatur”. (*Commelin. Præluđ. botanic. p. 46.*)

And it is to be obſerved, that all the preſent Writers allow our *American Aloes* to be the Production of this Plant, this *Aloes unica*, the *Vulgaris* of C. B. &c.

The Deſcription or Character of Barbadoes or American Aloes.

THIS Drug comes in very large (*b*) *Callabaſh* Shells, weighing many Pounds ; which, when good, is of a black ſad Red, like a raw Liver, of a cloſe Texture, ſmooth Surface, brittle in Winter, eaſily ſoftening in Summer ; in the Heart of the larger Lumps of an opaque tawny Appearance, from its Moisture not being intirely evaporated ; which makes it look as if it were fat ; moſt nauſeouſly bitter (even to a Proverb), and of an offensive ſtrong Smell, and, when powdered, of a clay-yellow Colour.

Of the modern Succotorine Aloes.

THE preſent *Succotorine Aloes* comes to us only from the *East Indies*, wrapped up by the Natives in Beaſts Skins ; which, when it comes into the Hands of the inland Trader, is divided into Sorts, generally Three.

I.

(*b*) *In-cucurbitis magnis*, as ſome Authors expreſs it,

The first, for its Purity, is called *Aloes lucida*; which is made up of small rugged Lumps, of a black-grey Appearance, as if occasioned by a Dust rising from its own Substance, appearing black when wet, transparent when broken (from whence it is called *lucida*); of a yellow Red, like Glass of Antimony, or clear Resin of Jalap; brittle, without that Tendency to soften in Summer, remarkable in the *Barbadoes*; of a bright Yellow, when powdered like Rhubarb; tasting but moderately bitter, mixed with a discernible Sweetness (a Circumstance I find no-where noticed by Authors, whence it may be called a bitter Sweet); of an aromatic Smell, very much resembling Myrrh, when its Parts are put into Motion.

The second Sort varies from the first, in being less pure, and oftener in much larger Lumps, called simply *Succotorine Aloes*. The coarser this *Aloes* is, the less is its Sweetness, as I have found. With this oftentimes some of the following *Aloes* is mixed; by which it appears of a tawny Clay-Colour, when freed from its own Dust.

This third Sort is remarkably different from the other Two, yet considered in Trade as a cheaper *Succotorine*, but by some Critics erroneously called the right Hepatic *Aloes*; because, when broke, it resembles a *boiled Liver*; whereas the true Hepatic should resemble a *raw Liver*; or, as *Fabius Columna* expresses it, clearer perhaps than any other Author, “Sanguinis concreti modo, vel potius hepatis simillimum,” as is already observed: Which Distinction between a *raw* and a *boiled Liver*, not being generally considered, has introduced some Confusion

fusion in this Matter. *De Kindar* * indeed, talking of this *Aloes*, says critically of it, “*hepatis costæ fere adinstar.*”

This Kind comes to us made up, some in smaller, some in larger Lumps ; rugged, as if several of the larger Lumps had clotted together ; which may be concluded from several Pieces of Beasts Skins intermixed ; when broke, of a very obscure yellow Colour, resembling a boiled Liver ; of an aromatic Smell, mixed with some Fetidness, as if Part of the *Barbadoes* Offensiveness had been blended with some of the modern Succotorine Agreeableness ; of a bitter Taste (without that discernible Sweetness found in the *lucida*), but far less nauseous than the *Barbadoes* ; less brittle than the former, that is softer ; which is the Cause of its clotting, and forming larger Lumps than the *Aloes lucida* ; in most of which respects it differs remarkably from all the other *Aloes*, and therefore must be another Kind, and not another Sort of the former *Aloes*. And tho’ Authors are not minute enough in the Description of it, yet, finding such an essential Difference, they have assigned it a Parent-Plant of a different Species from the others, called “*Aloes Guineensis, caballina, vulgari similis, sed tota maculosa*” (*Commelin. Prælod.*) ; whilst the *Barbadoes*, as I have already observed, is the Production of the *Aloes vulgaris*, C. B. or *Aloes Dioscorid.* of *Fab. Columna*. And the present Succotorine from the *Aloes Succotorina, angustifolia, spinosa, flore purpureo.* *Breyn. Prodrom.*

Yet Dr. *Herman* tells us, this *Aloes* is the Production of the same Plant with our *Succotorine*, but in different Countries ; this in *Socotora*, that in *China* : But the great Difference that appears in the Juices makes this Account not probable, were there not a different Parent-Plant fixed upon for its Production, as above. This Author calls this the hepatic *Aloes* (as if it were the true) from its boiled Liver-Colour.

E

Tho’

* *Nuc. Belgic. Mat. Med.*

Tho' these Three Sorts of Succotorine *Aloes* (as they are called) come all mixed in One Bale or Parcel, as I am assured they do, by Merchants who attend the Sales, and therefore probably from the same Place, yet this does not prove, that they are not the Production of different Species of the same Plant, as is above-mentioned. For *Garcias ab Horto*, who lived upon the Spot, in his Account of *Aloes*, tell us, *Aloes* came from other Parts of the World in his Time, as well as *Succotora*, as *Bengal*, *Cambaja*, &c. but that it was reckoned inferior to that of *Succotora*, and known from it by being less compact; which, says he, was occasioned by its being drawn from different Plants, "Alterius (meaning that of *Bengal*, &c.)
 "vero partes non possunt perfecte coire, quod succus ex diversis plantis collectus sit." *Garcias, lib. arom. 1. c. 2.* -- 2. If this incompact *Aloes* of *Garcias*, brought from *Bengal*, &c. is not the present *Succotorine*, tho' then least esteemed, and for that Reason, perhaps, less Care taken at that time in *curing* or preparing it for the Market; which may since, for its more grateful Smell, and less offensive Taste, have supplanted the other? For from some or all of these Places, even as far as *China*, the present *Succotorine Aloes* comes to the *East-India* Company, as I am informed.

What little Satisfaction is to be found in the latest Writers on the Natural History of this Drug; who, as they came last, should have filled up the Defects of their Predecessors!

Mr. *Dale* was so far in the dark upon this Head, in his first setting out, that he frankly tells us his former Errors, by an "Omnes de novo inferui," in his last Edition.

M. *Boulduc*, notwithstanding the Preference, given to this modern sweet-smelling *Aloes*, recommends the *American* or *Barbadoes* under the true Title of *Hepatic*.

In the following Trials, for the most part, I have used the foregoing *boiled-liver-coloured Aloes*, or *Herman's Hepatic*; which, for its Cheapness, when compared to the *Aloes lucida*, is most likely to be ofteneft used; and when the Circumstance of Cheapness is joined to the Preference that such an Author as Dr. *Herman* gives it, the Physician may consider it as a venial Deviation from his Orders, if it should sometimes be used in Trade for the *Aloes lucida*, and common Succotorine; which last is rarely without some of this *Herman's Hepatic* mixed with it; as may be known, by breaking some of the Pieces.

It now follows, that we analyse this Simple, in order to know its component Parts; by which we shall be the better able to judge what it is, and what manner of Manufacture it will best bear, with Safety to its Virtues.

EXP. I.

Powder Two Ounces of *Herman's Hepatic Aloes*, as above, together, that the Drops may be equally divided; macerate One Ounce of this *Aloes* in River-Water, near a Fire; helping the Solution, by often shaking the Bottle. When this is saturated, pour on fresh Water, till it will afford no more Tincture.

This, tho' it soon imparted some of its Substance to the Water, yet required repeated Affusions of fresh Water, before it communicated its whole dissolvable Substance.

This Ounce of *Aloes*, thus dissolved, left One Drachm and an half, and Seven Grains of a friable inflammable Body, made up of Resin and Dirt.

During the Solution of this Simple, it shewed a great Tenacity, like a softened Resin, or thicker Balsam; which, for want of greater Heat, required frequent Shaking, to divide its Parts, because of their Cohesion.

EXP. II.

Take the other Ounce of *Aloes*, and macerate it likewise in rectify'd Spirit of Wine or Malt, pouring on fresh Spirit, till it will tinge no more ; and the *Residuum* will shew that the Spirit of Wine has dissolved its whole Substance ; for, upon Trial, there was but One Drachm of a light Sediment left ; which, upon infusing in fair Water, scarce altered its Taste ; an Argument it was mere adventitious Dirt. The Difference, then, between these Two Ounces, in their *Residua*, is Thirty-seven Grains ; which, as their Dirt was equally divided, must be the Resin, which the Water could not dissolve : So we may conclude, allowing for Waste, that there are about Forty Grains of Resin to an Ounce of *Herman's Hepatic Aloes* ; which *Aloes*, in his Opinion, differs from the sweet Succotorine, only *loco natali* ; and which he expressly prefers ; “ *Quæ mihi optima videtur,* ” are his Words. *Herman. Cynosura Mat. Med.*

In these Two Experiments there was likewise to be observed, that a greater Portion of Water than Spirit was used in dissolving the same Quantity ; and that *Aloes*, tho' put into the Water in fine Powder, coalesced, and became a cohesive Substance, difficult to divide ; but, when put into the strong Spirit in Powder, continued in Powder divided, till it was totally dissolved ; that is, without any Signs of Coalescence or Cohesion.

EXP. III.

Dissolve Two Ounces of the same kind of *Aloes* in Water over a Fire with a moderate Heat, and it will require such a large Portion of Water to take it up intirely (that is, all that is dissolvable in Water), that, when compared to the foregoing Experiment made by Maceration only in Water, excepting the small additional

additional Heat of an adjacent Fire, proves to us, that this Simple, like crude Tartar, requires a great Portion of Water to dissolve it; as if a small Quantity so loaded that *Menstruum*, as to render it incapable of taking up more of its Substance; which is no new Opinion, tho' not sufficiently proved perhaps hitherto, so as to prevent some ill Effects arising from a Want of this Knowledge in the Preparation of Medicines made of this Simple, as will appear.

EXP. IV.

Evaporate the watry Solution of the foregoing Experiment, when limpid, to the Consistence of the original *Aloes*, by a very slow Heat, by which it will become a beautiful bright red Substance, agreeable to that of *Angelus Sala*, which he calls *Balsamum Aloes*, but more properly is the *Aloes lota*.

EXP. V.

Digest this inspissated *Aloes* in *Alcohol Vini*, according to *Exp. 2.* of this Chapter, and it will dissolve in this *Menstruum* now, as it would before it had passed the former Process, according to the same *Exp. 2.* Upon my first Trial, it did not dissolve; which must have been an Error in the Process.

In order to know also what Alteration this watry Extract of *Aloes* might have suffered as a Medicine, I made a Trial, and found it purged less than the crude *Aloes*; which is confirmed by a Passage in *Hoffman*, who tells us, that *Aloes* loses of its purging Quality by boiling: His Words are, “ Quod si vero
“ cum aqua, v. g. pluviali, solvitur et decoquitur
“ paulo longius, enervatur vis ejus cathartica, ut
“ plane inefficax fiat nisi dosis intendatur.” *Fred. Hoffman. Obs. Ph. ch. p. 168.* If much boiling then will impair its purging Quality to such a Degree, a tedious Evaporation, tho' without boiling, should,

in proportion, injure (c) it also in the like Respects, as is proved.

Are not these Reasons to deter us from the too free Use of *Chemistry* in *Pharmacy*; as well as Matter of Admiration at the Nature of Things?

This also informs us, that the separating the Resin from this Simple, does not render the remaining saline Part more purgative, as has been thought; because it is done by the above Method with Water, by means of Evaporation with a continued Heat; which Heat, as I have proved, impairs its purging Quality.

But, to be thoroughly informed of the Nature of this Drug, let us pursue the Experiments.

EXP. VI.

Take Two Ounces of the above *Aloes*, reduced to fine Powder together, by sifting and afterwards mixing them, that their feculent Part may be equally diffused; which dispose of as follows:

Take Four Drachms of this powdered *Aloes*, and One Pint of River-Water:

—— Four Drachms, and One Pint of *French White-Wine*:

—— Four Drachms, and One Pint of common Proof-Spirits of Malt, lowered in the Proportion of Half a Pint of Water to a Pint of the Spirits, like some of the compound Waters, as *Aq. Bryon. c.* &c. *M.*

—— The same, with a Pint of neat Proof-Spirit.

Digest these in a Bath-Heat for Three Days; after which set them aside, for the undissolved suspended Particles in the watry *Menstruum* to subside.

Take

(c) “ Odi idcirco simplicium præparationes, quoties lotio, ebullitio, afflatio, associatio, vel calcinatio virium dispendia facit.”
Van Helmont Dispens. moderna. pag. mci lib. 464.

Take also Four Drachms of the above Kind of *Aloes* ; and the same of *Aloes Succotorina* ; and digest both in Two separate Pints of rectify'd Spirit of Malt for Three Days, as above ; and the Result will be (as I have found it) as follows :

Four Drachms of *Aloes* with the River-Water left undissolved One Drachm and an Half ; the powder'd *Aloes* coalescing, when put into the *Menstruum*, and shewing a Tenacity like softened Resin.

That with the White-Wine left undissolved One Drachm and Two Scruples ; which, like the former, coalesced, and became tenacious.

That with the Proof-Spirit, diluted, left but Half a Drachm of an earthy Substance, tasting somewhat of the *Aloes*.

Here the *Aloes* began to shew itself in Powder in the *Menstruum*, as it was put in ; continuing divided, and not coalescing, as in the more watry *Menstruums* above ; because of the Strength of this Liquor in comparison with them, as will appear.

That with neat Proof-Spirit left undissolved but Twenty Grains, which tasted somewhat of the *Aloes*.

These were all from the Two Ounces of *Aloes* powdered fine, and afterwards mixed for this Purpose, that the Dirt might be equally diffused.

That with rectify'd Spirit of Malt, and *Herman's* Hepatic *Aloes*, left Twenty-three Grains of a tasteless Earth.

That with the Succotorine, and the same Sort of Spirit, left Twenty-five Grains of tasteless *Fæces* : In both which the *Aloes* continued divided in Powder, as it was put in, till dissolved.

The Account then stands as follows :

	3	℥	gr.
From River-Water, and Four Drachms } of <i>Aloes</i> , was left undissolved - - }	1	1	10
From White-Wine, &c. - - - -	1	2	0
From Proof-Spirit diluted, &c. - -	0	1	10
From neat Proof-Spirit, &c. - -	0	1	0
From rectify'd Spirit, and <i>Aloes</i> of a dif- } ferent Parcel, but the same Sort, - }	0	1	3
From the same, and <i>Aloes Succotorina</i> ,	0	1	5

These Experiments prove to us, that the watry *Menstruums* could not take up more of the *Aloes*; agreeable to our former *Experiments* 1 and 3 of this Chapter: And this, probably, because they are incapable of dividing the Parts of this Drug in the Proportion here used, and keeping it so, when divided by Heat; whereas, in the spirituous *Menstruums*, the *Aloes*, being put into them in Powder, never coalesced, but continued in Powder till all was dissolved. So that such Bodies as have a Property of keeping *Aloes* divided in these watry *Menstruums*, must contribute to the readier and completer Dissolution of it.

In a very large Proportion of Water this Drug readily dissolves with Heat.

We learn from hence, how improper a *Menstruum* White-Wine is for the *Tinctura sacra*, in which so little of the main Ingredient *Aloes* must be dissolved: But we learn also, from these Experiments, how small a Portion of rectify'd Spirit of Wine, being added to that *Menstruum*, will help that Solution: For the Proof-Spirit diluted, in which there is so little inflammable Spirit, came very near to the neat Proof in the Quantity it dissolved. It is very probable, if Eight Drachms of *Aloes* had been digested in the watry *Menstruums*, instead of Four, there might have been more dissolved; for there seems to be something in this Drug, that soon communicates; which, by increasing the Quantity, might give the stronger Tincture. But this is a Supposition.

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I have observed, upon another Occasion, that, from a more tedious Digestion, the White-Wine will have taken up somewhat more of the *Aloes*; but, in a few Days, it has grown turbid, and precipitated Part again: Which proves, that it cannot contain more, as being a watry *Menstruum*, than a certain small Portion of this Drug: Which is not the Case with the more spirituous *Menstruums*; for they all dissolve it more plentifully, and some of them totally.

Is not this the Reason, that a small Portion of *Elixir Proprietatis* is found to purge more than a much larger Portion of *Tinctura sacra* made with White-Wine, because its *Menstruum* is strong Spirit of Wine, that dissolves all the *Aloes*.

And, to shew the Excellence of this *Menstruum*, rectify'd Spirits, I added, to that which had dissolved all the *Aloes* first used in *Exp. 6.* more *Aloes*; and it continued to dissolve this also. So that it is probable, that this *Menstruum* may be loaded with this Drug, as with any dissolvable Resin or Balsam; which cannot be said of the watry *Menstruums*.

Some Authors, finding a Tincture made with rectify'd Spirit of Wine, and this Simple, to purge as in its crude State, have imputed the purging Quality to its Resin; not dreaming that it could dissolve what they call the gummy Part. So we find in Doctor James's Dictionary; who tells us, "*The resinous Parts, extracted by Spirit of Wine, will purge violently; and the gummy Part, extracted by Water, is a good Vulnerary.*" Which is just inverting the Sentiments of other Authors of Credit; for *Valentini* tells us, "*Resina Aloes substringit;*" and *Herman* says, "*Vim purgantem habet in substantia gummosa, cui quippiam mucaginis resinosa, in qua vis styptica et balsamica juncta sunt.*" Here it appears, that some Writers on the *Materia Medica* have spoke without Experiment on this Subject. We have shewn how little Resin there probably is in an Ounce
of

of this Drug; and yet, that *Alcohol Vini* will dissolve that whole Ounce: Therefore what *Alcohol* dissolves in this Simple is least of it Resin.

The Difficulty of dissolving this Drug in Water explains to us the Use the *Indians* make of the droffy Part of it, which *Reiger* and other Authors assure is, in besmearing the Bottom of their Boats and Ships with it, instead of Pitch, to defend them from the Water. For, did not they well know it would with Difficulty dissolve in Water, they never would use it for such Purposes.

As the Resin of this Drug is so small, in proportion to the rest of its Substance, it can scarce be the Cause of so much (*d*) Mischief as is imputed to it; but we may suppose rather, that the Tenacity arising from its whole Substance, joined with its native (*e*) Acrimony, produces all the Ills arising from it.

As the most universal domestic Purge, where *Aloetic* Medicines are proper, is *Anderson's Scotch Pills*; and this from their remarkable easy Operation, attended with very salutary Effects; in order to know from whence proceeds this Excellence in the above, to the crude *Aloes*, or ordinary Preparations thereof, that is, if the destroying this Tenacity in the

(*d*) “*Aloes ablutione succum amittit, meraque resina manet residua, quæ sui ad intestina adhæsione, torminum et hæmorrhoidum est concitatrix.*” *Van Helmont. Disp. med. p. 464.*

(*e*) “*Ob singularem acridinem excitat hæmorrhoidum fluxum, venasque hæmorrhoidales aperit.*” *Herman. Cynosura Mat. med. p. 219.*

Perhaps this Acrimony may not be so readily perceived on the Palate, notwithstanding this Authority for it; but whatever stimulates the Bowels, during its Passage, so as to excite a Purging, may be supposed to be of an acrid Tendency; which, confined to one Place, by an additional adhesive Quality, as in this Drug, may produce the Ills usually arising from it, without imputing any Part of these Ills to its small Portion of inactive Resin; which, as *Valentini* tells us, is only subastringent; perhaps, like an indolent Bole or Earth.

the *Aloes* might probably be the Cause, make the following Trials :

EXP. VII.

Take a few Grains of *Anderson's Scotch Pills*, as they are vulgarly sold, such as may be thought genuine (for there are Counterfeits, as I have found) ; and add to them a small Portion of cold Water. Take also the same Weight of crude *Barbadoes Aloes* (for of this *Aloes* only, I am told, the true are made, which indeed may be discerned, from their Taste), and add to it the like Quantity of cold Water. Macerate these for some time (I did it in the Month of *June*) ; shake the Bottles now-and-then, and by next Morning the *Anderson's Pill* will be entirely melted, and a great Part dissolved ; with no Sign of Coalescence or Tenacity, excepting a few small Particles specking the Glass ; whilst the crude *Aloes* will only communicate to the Water an offensive Bitterness and Smell, sticking to the Bottom of the Glass, which continued in my Experiment undissolved for some Months after.

There is some Reason to impute the Preference of this Medicine to most other *Aloetic* Purges, to the Tenacity of the *Aloes* being broke : What it is that takes off the Tenacity, I cannot learn, the Receipt being a Secret only in the Hands of a Few ; but it is highly probable this Pill is but an Improvement of the *Pill. Angelicæ* of the *Augustine Dispensatory*, which is a Composition of *Aloes*, *Rhubarb*, *Agaric*, and some vegetable Extracts ; which Extracts are, perhaps, the Cause of this Divisibility of the *Aloes*. *Zwelfer* says great Things of this *Pill. Angelicæ* in his Remarks, very consonant to the Character *Anderson's Pill* bears. In order to know what Substances would readily produce this Division of the Parts of *Aloes*, I made the following Trials :

EXP. VIII.

Take *Aloes* half a Drachm ; Salt of Tartar Five Grains ; River-Water One Ounce and an half.

— *Aloes* half a Drachm ; *Castile* Soap Twenty Grains ; River-Water One Ounce and an half.

— *Aloes* the same Quantity ; Loaf-Sugar One Drachm ; River-Water as before.

— The same with *Manna* half a Drachm, &c.

— The same with Sheep's Gall Two Drachms, &c.

— The same with Honey half a Drachm, &c.

— The same with the Yolk of an Egg Two Drachms, &c.

These were mixed by Trituration in a Mortar ; in which it was observable, that the small Portion of Salt of Tartar exceeded all the other soapy Bodies, in dividing the *Aloes* into a mere Pulp, and dissolving its greater Part in the *Menstruum* ; which has been recommended by Writers as the best Corrector, but with a Caution of not being too free with it, lest it destroy the purging Quality of the *Aloes*.

Next to this, the Egg, Sheep's Gall, and *Castile* Soap, answered the End best ; that is, in dividing the *Aloes* so as to take off its cohesive Quality.

The *Manna*, Sugar, and Honey, were far inferior to these in the Quantity here used ; but, as they are well known to be soapy Bodies, they must be effectual to the Purposes here intended, when used in proper Quantities.

History informs us, that Honey was one *Medium* for giving *Aloes* in, amongst the old Writers. And perhaps the *Hiera Picra* is the worse Medicine, for the Change of its Form from an Electuary with Honey, into a Tincture with Wine, on account of the Soapiness of the Honey.

One would imagine, that as the Sheep's Gall divided the *Aloes* readily, and broke its Tenacity, so must the human Gall, as this passes the Guts. — It
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is observed, that *Aloetic* Medicines operate best when given near a full Meal, to be digested along with it; that is, *ante Cibum*; by which means this Tenacity is the sooner broke, by the Intervention of the Food, assisted by the Gall: And as *Aloes* is a friable Substance out of the Body, it becomes more adhesive by Heat, when in the Body; which Stickiness, when joined with its native Acrimony, does, probably, produce those Ills proceeding from it, like the purging Resins, as Jalap, Scammony, &c. which require Correctors, not because they are Resins merely, but that they are acrid Resins, made tenacious by the Warmth of the Guts; from which Two Qualities they are made to stick to and vellicate those tender Parts thro' which they pass; which is not the Case of common Resin, tho' it becomes tenacious by Heat also, because it wants the Acrimony. I must leave it to others, to explain why Scammony, Resin of Jalap, &c. are found to produce Inconveniencies so different from *Aloes*; this, the Piles, particularly, and sometimes *Tormina*; those, *Tormina*, &c. and not the Piles; as this is but an Essay to contribute towards the meliorating this Simple for medicinal Uses. And tho' *Aloes* be not a Resin, yet, if it has a Cohesion equal to Resin, joined with Acrimony, it is the same Thing in this Case: And it so resembles it, when softened by Heat or Moisture, that *Van Helmont* took it for such, as appears from his Words, "*Aloe* ablutione succum
 " amittit, meraque resina manet residua, quæ sui ad
 " intestina adhæsione torminum & hæmorrhoidum
 " est concitatrix." *Van Helmont Pharm. & Dispens. Modern.*

This Passage brings me a little out of the Road, tho' to a Matter proper to be considered in this Place; that is, the Manner of preparing *Aloes lota* in *Helmont's* Time, which seems to be quite opposite to the present Method of doing it, by throwing away
 what

what Water would readily dissolve, and reserving the Remainder for Medicine; by which it suffers remarkably, as appears in a Passage or two in *Galen*; from whence we may learn that the same Method prevailed in his Time also: His Words are, “ Porro
 “ ad ventris subductionem *illota Aloe* est aptior, elota
 “ autem multum de medicamentosa vi amittit.”
Galen de Comp. Med. lib. viii. in Conf. Stomach. Androm.

And again, “ Si ab *Aloe* quod purgat, ab eo quod
 “ est astringens, *eluatur* (id quod fieri potest per ex-
 “ actam lotionem), tunc certe aut debiliter aut plane
 “ nihil purgabit.” *De Simpl. Med. Facult. cap. xiv. lib. iii.*

These Two Passages, I first thought, confirmed *Hoffman*’s Observation already quoted, of *Aloes* losing much of its purging Quality by boiling; as if their *Aloes lota* and ours were the same; till that of *Helmont*, compared with the Two Words in the above Translation of *Galen*, *eluatur* and *elota*, inclined me to think otherwise; these Words signifying to wash something out, in order to be thrown away, as Dirt from Linnen, &c. whereas the modern Method preserves all that dissolves in Water, rejecting what remains undissolved.

EXP. IX.

But, to confirm my Opinion of some vegetable Extracts having a Property of dividing the Parts of *Aloes*, I tried with the Extract of Gentian-Root; and it answered my Expectation.

EXP. X.

I tried also with a Vegetable not in the Form of an Extract, which was Saffron: This suddenly subdued it.

E X P. XI.

These Two Experiments induced me to try if the aromatic Ingredients in the Species *Hieræ Picræ* assisted any thing towards this useful End of dissolving the *Aloes*, by first breaking its Tenacity ; but they disappointed me ; for the Division of the *Aloes* was so little, the Tenacity being so obstinate, that what was at last in some manner performed, I believe was occasioned merely by the small Portion of Saffron in that Composition ; for the Action of the other Ingredients seemed to be but a gross Interposition of their Parts ; which might, perhaps, be as well performed, by using *Sand* in their stead ; which is not the Division here meant, that is, not such a Division as was produced by the Extract of Gentian, and the Saffron alone, in the foregoing Experiments ; the Thing desired.

It may be remarked, why the strong Spirit of Malt, or *Alcohol* before-mentioned, is not ranked here among these kind of Bodies ; being such as divide the *Aloes* readily, and therefore the more readily dissolve it. The Experiments on that Head prove it to be a ready Dissolvent, but not from a soapy Quality ; for want of which, this Simple may probably coalesce again, when that *Menstruum* is diluted, or its Power broke, when taken into the human Body, by Fluids conveyed along with it : So that there is a Regard to be had to the different Principles with which the different Materials here mentioned do act upon this Simple ; for both may have their proper Uses in the Hands of the Judicious. I have been told, that it is a Custom with some, when *Aloes* lies too long in the Bowels without operating as a Purge, to give a large Glass of some spirituous Liquor, or as large a Dose as the Patient can bear, which, say they, sets this Medicine upon working ; which, if true, must be occasioned by its dividing the Parts of this Drug, even when it is in the Stomach or Bowels ; which is
not.

not improbable from the Experiments here made on it with neat Proof-Spirits, and even that diluted. *Vide Exp. 7. of this Chapter.*

EXP. XII.

I have One Experiment more on this Head, which seems to be overlooked by the Writers on the *Materia Medica* in general.

I took a strong Solution of *Aloes* made in Water by Maceration, that is, without Heat, which I set aside for several Months; during which Time it passed our Summer's Heat; at the End of which I could find no Signs of Corruption in this Liquor, neither Tokens of Acefcence, nor Alcalescence, nor a corrupt Smell. It is to be remarked, this Solution was kept in a Bottle well stopped or corked; for, had it been set aside open, exposed to the Air, the watry Vapours ascending from the Surface, being probably free from the Influence of this Drug, and condensing at the Sides of the vacant Space in the Bottle, might receive such Alteration from the Air, as to produce what often appears on these Occasions, a Mucilage on the Surface of the Liquor, and with that a Mouldiness; which Consequence often attends the Apothecary's putting a small Quantity of a well saturated Syrup into a large Vessel; where the Vapours ascending, and not being thoroughly dispersed, fall back and corrupt, whilst on the Surface; or, according to the Opinion of some, vegetate; whilst the Medicine itself may continue good, excepting a Mouldiness contracted by the Mucilage and Mouldiness generated on its Surface. Something like (*f*) this appeared on a Bottle of the above Solution, which was by Accident left uncorked.

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(*f*) This Dr. *Boerhaave* remarks, in his *Elixir Proprietatis, ope aquæ stillatitiæ*: “Hoc Elixir egregium id habet vitii, quod “asservatum diu mucilaginem in superficie acquirat.” *Process. 82.*

I must inform the Reader, that I did not repeat this Experiment, it taking up too much Time.

The above Experiment is a great Argument in favour of the antiseptic Qualities attributed to this Drug, by most Writers of Credit ; amongst whom *Muntingius* says of it, “ Omnem putredinem arcet, necnon diu cadavera corruptionis vel putrefactionis immunia cum
“ *Myrrha* præsertim aliisque mista conservat. Qua
“ re nonnulli mumiaë efficaciam omnino possidere
“ contendunt, eamque præter *Aloem* humana pinguedine mistam nihil aliud esse asseverantes.”
Munting. Aloidar. p. 27.

Is it not from this Principle that this Drug operates with such Effects in Crudities and Indigestions in the *Primæ Viæ* ? That it has been found to be a Resister of Corruption ? And are not the *Pil. Pestilentialia* properly so styled from this Ingredient alone, were there no Myrrh in that Composition ? And how useful a Medicine must the officinal *Pil. Rufi* be in Cases of Contagion and Corruption, on account of this One Ingredient ! What Uses then may be made of *Aloes* from this Property ! But these are submitted to the practising Physician.

We must now see to what Class of simple Medicines this useful Drug belongs. By its dissolving in those Two remote *Menstruums*, *Alcohol Vini*, and Water (tho' indeed readiest in *Alcohol Vini*), it seems to be of the soapy Kind ; yet it shews such Properties, as would make one think it a Substance *sui generis*. Some Writers have consider'd it as a soapy Body, not from the Analysis of it, that I can learn, but from its Effects rather, as a Medicine. So one would conclude from *Reiger*, in his *Introductio ad Notitiam Rerum naturalium*, &c. where he says, “ Agit assumpta *Aloe* solvendo vi saponacea.”

Before we quit this Subject, I must further observe, that as I have considered the total Solution of *Aloes* in rectify'd Spirits of Wine (alone, without

the Help of alkaline Salts, or other soapy Bodies) as a new Thing, which Artists are not acquainted with, nor Chemists have wrote of, that I can learn; yet a superficial Critic may dupe us with a Quotation from *Zwelfer*, if not explained. This Author orders rectify'd Spirit of Wine to dissolve *Aloes*; because, says he, it has some Resin, and therefore will not all dissolve in Water alone; so that if this had been our rectify'd Spirit (which is almost *totus ardens*), there would not be sufficient Phlegm in the *Menstruum* to dissolve the gummy Part, according to his Doctrine; therefore it cannot be our rectify'd Spirit he means, but a stronger Kind of Brandy, or double Proof-Spirit, which is between Brandy and *Alcohol*: For, when he means the rectify'd Spirit we have in common Use, he calls it, *superlatively, rectificatissimus*; and the other, with a proper Portion of Phlegm, *positively, rectificatus*; which he further explains as follows; as in one place he says, “ *Aloes* — cito in spiritu vini resoluibilis:” So, in another, he explains to us what Spirit he intends for such Uses; “ Interim hic notandum est, quod dum spiritum vini pro extractione rerum catharticarum commendamus, non illum intelligamus, qui summe alcoholizatus — sed illum hic intellectum volumus, qui a superflua et immodica aquositate aliquatenus liberatus sit.” So that the Phlegm is here intended for the gummy Part, and the Spirit for the large Portion of Resin, as he imagines, in this Simple: Which Caution he needed not to have given, had he known that the whole Substance of *Aloes* would dissolve in his *Spiritus rectificatissimus*, or *Alcohol*: And yet how small a Portion of Resin is in that whole Substance! which perhaps is not One Seventh Part.

C H A P. VI.

Of SAFFRON.

THE *Saffron* most in Esteem is the Production of *England*: This comes to Market in the Form of Cakes, closely compressed; which, as all other *Saffron*, is made up of a Collection of Threads or Filaments which form the *Pistillum* of the Flower of the officinal *Crocus*, or *Crocus autumnalis sativus verus*, *Raii Synops.* p. 232.

Tho' it be the *Pistillum* of this Flower, which alone is the medicinal Part of this Plant in Use (and called *Saffron*), yet some (*a*) Authors of Credit have said inadvertently (for it could not be from a Want of Knowledge in the Names of those Parts, which make up the Attire of a Flower), that it is the *Apiculæ Staminum*, and *Stamina*; the Misapplication of which Terms may set a Novice wrong in his Enquiries this Way.

The *Pistillum* of this Flower begins near the Root of this Plant, where the Seed-vessel or *Ovarium* lies, and runs up in a white Thread thro' the Tube of the Flower (which Tube looks like the Flower-stalk, from its Length), till it reaches the Bottom of the beautiful purple Flower-leaf, and then begins to divide itself into Three Threads or Filaments, of a flame-red Colour; which being commonly taller than the Flower-leaf, are, at the Time of gathering, seen peeping out at the Top of the Flower, which is closed up about them: Round these fiery red Filaments,

at

(*a*) “ Quod in folis apiculis staminum floralium croci aureis observatur.” *Boerhaav. El. Ch. Tom. 2 p. 244.*

See also the *Botanicum officinale de Croco.*

at the Inside of this Blossom, or Flower-leaf, are fixed the *Stamina* and their *Apices*, which are Three or Four white Stalks, with a yellow Substance fixed on the Top of each, not unlike the Tongue of a Bird; which are always thrown away, in gathering the *Saffron*, along with the beautiful Blossom to which they are joined.

These Three flame-colour'd Threads then, only are the *Saffron*; yet, in what we see come to Market loose, that is, uncaked, we find joined to them One whitish yellow Fibre, which is some Part of the *Pistillum*, before it divides itself into the Three *Saffron* Threads. This yellow Fibre is never in View in the Plant till dissected; and which, at gathering, should be thrown away, as serving no Ends but to increase the Bulk of this Commodity for the Market. In the *English Saffron* we do not see it so readily; because their manner of caking it makes all of the same Colour; and therefore to the Buyer appears as if all was made of these flame-coloured Filaments only.

The *Saffron* fit for the following Trials, as well as all other medicinal Uses, should be *English*; which, when good, is known by its Filaments being broader than those of other Countries, of a fiery red Colour in the Cake; when chewed, of a deep Yellow; neither dry, nor yet moist, but soft, closely compressed in the Cake, of the same rich Colour within as on the Outside, of a powerful acrid and somewhat aromatic Smell, not unlike a weak aromatic, volatile, urinous Salt: That which is of an obscure yellow Red, and less powerful Smell, may be suspected for being old, or otherwise damaged.

These Cautions may be thought necessary, when we consider what Quantities of this Drug are to be met in Trade not fit for the Physician's Purposes. It therefore may be laid down religiously, as a Rule, That, in all Cases where the Physician puts a Stress on it (upon which Occasions the Dose is generally

adjusted to a few Grains) none other be used, but such as is the Product of *Britain* or *Ireland*, and this the Growth too of the same Year: For it must be a great Disappointment, in Five Grains of this Medicine, to have Two or more effete, by Age, or other Accidents.

To this we may add, that a great Quantity of *French Saffron* is imported; which is no-ways to be rejected, as being, probably, much superior to that *English* which is not prime. This comes loose in Sacks, and then shews those yellowish-white Tails, joined to every Three red Filaments, which I have been talking of.

There is another Sort brought from *Spain*, generally besmeared with Oil of Olives, in order to preserve it, as they think. This should not be admitted in Medicine on any account, for its Baseness. 'Tis to be noted, that the *French* Sort is oftentimes caked, in Imitation of the *English*, after Importation; and perhaps too often sold as such; but it may be known, by its Blades being not so broad as the *English*; with other Tokens, known only to the sagacious Buyer, and not readily to be described here.

The Necessity of using the present Year's Growth of *Saffron* in Cases of Moment, arises from the vast Loss this Drug sustains by Time, from the Volatility of its Parts; which every Dealer in it must know, by handling large Quantities of it; for such acrid Vapours rise from it, as oftentimes affect the Eyes of the Person concerned with an Inflammation, not unlike the Effect of Smoke from burning Wood. These Vapours I have found to smell, as is before-mentioned, like a weak, aromatic, volatile, and urinous Salt, whose Pungency is very well known, and whose Acrimony, when it is closely confined to the Skin, as Doctor *Boerhaave* tells us, is caustic; which, I have been informed, is the Case of *Saffron*, when so

applied : From all which we may conclude there is some Affinity between them.

The *English Saffron* then has this Advantage above that of other Nations, That the Autumn in *England* (at which Time of the Year it is in its Perfection) is not so hot as in the neighbouring Countries ; by which means these volatile Parts are less liable to Diffipation ; which is farther prevented, by their manner of caking it, which must preserve it by the Compactness of its Form, which the *French* and *Spanish* want, at Exportation from those Countries. It therefore may be pertinent to our Subject, to submit a Method for preserving this rich volatile Drug from suffering by lying-by, whilst in the Hands of those who prepare it for the Sick ; which may be done, by providing a Vessel in proportion to the Quantity, made of Pewter or Lead, with its Cover, in which the *Saffron*, being wrapped first close in Bladders in small Quantities, is to be laid ; over which may be also put, wrapped likewise in a Bladder, that *Saffron* which is for less important Uses, which the Apothecary is seldom without ; over all which is to be laid an heavy Plate of Lead, fitted to the Form of this *Theca*, or Repository, so as to sink down upon the Matter contained, that the Vapours may be the closer confined by the Pressure of the Lead ; and in this manner to be laid by till used, the Vessel being covered also with its ordinary Cover.

I knew a Person, who, having taken a small Quantity of fresh *English Saffron* that was good, out of a larger Parcel, and preserved it in the above manner, found, by that means, such incredible Difference between the Remains of the Parcel it was taken from, some Months after, and this so preserved, as should invite every one, of tolerable Probity and Care, to the like Practice.

This Advice is submitted to the Apothecary only, who should never lay in more of this Drug than will
serve

serve him to the Return of the Season ; which is little, in Comparison to what the Dealer in this Article brings to Market. 'Tis supposed also, that often having recourse to this inclosed *Saffron*, will so ventilate it, as to prevent a Mouldiness ; which is found to attend a larger Quantity so confined, for want of Air.

'Tis the Opinion of some, that *Irish Saffron* is preferable to the *British* ; which is probably true of what is now produced in *Ireland* ; but it is neither occasioned by the Climate, nor yet by the Soil, as some, from a Fondness to the Country, would fain intimate ; but rather, that what has been produced hitherto in that Country, has been more for Amusement, than the Market ; and therefore the more Care has been taken about it : For no Farmer will take the same Pains with Acres of this Commodity for Sale, that a private Person will with a Plot in his Garden, for his own particular Use and Diversion.

We now come to the Experiments, in order to find out what Class of the *Materia Medica* it belongs to ; and, by that means, what manner of Preparation it will best bear with Safety to its Virtues, for the Use of the Sick.

EXPERIMENT I.

Saffron (b) macerated in River-Water soon gave a saturated Tincture, with a great Quantity of indissoluble Matter floating like a light *Farina* ; the Blades of *Saffron* becoming white, as if quite exhausted of their rich medicinal Substance ; but its yellow Tincture was soon lost, the *Menstruum* growing acid.

E X P.

(b) It is to be observed, by Maceration is here meant cold Infusion, as is already observed.

E X P. II.

Saffron macerated in White-Wine Vinegar afforded a less yellow-colour'd Tincture than the former, depositing a light Substance of a mealy Appearance. This kept its Colour for some Months, but afterwards lost a great Part of its yellow Hue.

E X P. III.

—Macerated in a weaker Vinegar, presently afforded a Tincture like the former; but soon totally lost it, depositing a Sediment or *Farina*.

E X P. IV.

—Macerated in *French* White-Wine, afforded a Tincture less yellow than in Water; the Filaments appearing of a yellow Clay-Colour, as if somewhat of the medicinal Part remained undissolved, depositing a light *Farina*. This Tincture lost much of its yellow Hue in a short time after.

From these Three last Experiments we learn the Reason that a Tincture of *Saffron* made with Treacle-Water, or any other *Menstruum* wherein there is a vegetable Acid diluted, fades in a short time; in-somuch that, from a deep Yellow, it becomes of a light Amber-Colour, as if no *Saffron* had been used in the Preparation.

E X P. V.

I took Two Drachms of *Saffron*, and macerated it in Six Ounces of *Canary*, and it afforded a deep Tincture; which indeed the native Colour of the *Menstruum* helped; the Filaments remaining of a dark Clay-Colour, with a large Portion of the above indissoluble *Farina*, more than in any of the foregoing Experiments.

My Reason for being so particular in the Quantities used in this Experiment above the rest, was, because *Canary-Wine* is a *Menstruum* used not only for this Simple, but several others in our *Pharmacopæia*; which might perhaps be changed for one more fit.

EXP. VI.

The Blades of *Saffron* in the last Experiment, being of a dark Clay-Colour, gave me some Cause to believe, that the medicinal Part was not all taken out; and therefore I macerated them afresh in Four Ounces of *French White-Wine*; to which they afforded but a dilute Saffron-Colour, and deposited a new *Farina*, of a paler Colour than that of the former.

EXP. VII.

The *Farina* or the *Canary Wine-Infusion* being so great, in proportion to any of the rest, so as to weigh half a Drachm when dry, that is, a fourth Part of the *Saffron* put into the *Menstruums*, I made the following Trial with it.

This dried *Farina* I laid by the Fire on a clean Piece of Paper; by the Heat of which it became soft, like a softened Resin, and also stained the Paper oily; which I afterwards macerated in a *Menstruum* made of Three Parts of rectify'd Spirits of Wine, and One Part Water (called a double Proof-Spirit); to this it gave a new Tincture, higher-coloured than the first made with *Canary Wine*, depositing a new indissoluble *Farina* of a pale Colour; a Token that all the medicinal Part was dissolved.

From these Three last Experiments it appears, that *Canary Wine* is a very unfit *Menstruum*, for such Substances whose Virtues are expected from small Doses; such as the *Tinctura Croci*, *Laud. liquid.*
Sydenham.

Sydenham. Syrup. Croci, &c. and this because it is too mellaginous, or, as it is sometimes expressed, too fat a *Menstruum*. This has been since proved to me by a Gentleman curious in Experiments of this Nature, as well as others of more Importance; who, upon evaporating a Pint of Sack, which he industriously searched for as (*c*) genuine, got, as a *Residuum* of that Evaporation, a mellaginous Substance weighing Two Ounces, whose Consistence and Appearance was not unlike Honey boiled to an Hardness. If then, to a Pint of any simple Liquor, whether Water, or *French White-Wine*, which are both free from this mellaginous Substance, you add Two Ounces, or rather Three (for Two Ounces of harden'd Honey are perhaps equal to Three in the natural State) you will have a *Menstruum* rendered incapable of dissolving as much perhaps by these Three Ounces, as it would have done before this Addition. Is not this a Reason why * *Canary Wine* must be a less fit *Menstruum* for the above Uses than one less loaded?

EXP. VIII.

Saffron, macerated in rectify'd Spirit One Part, and Water Three Parts, gave a saturated Tincture, loaded with a great Portion of the Tincture.

EXP. IX.

— In rectify'd Spirit and Water equal Parts, it afforded a beautiful Tincture, with the like mealy Matter, but less in Quantity.

EXP.

(*c*). If genuine Sack be so mellaginous, what are we to expect from the adulterated Sort, made of White-Wine and *Malaga Raisins*; or, as Mr. *Miller* informs us, of *Rhenish*, either by a strong Decoction of *Malaga Raisins*, or by a Syrup of Sack, Sugar, and Raisins? *Miller's Gardener's Dictionary on Wine.*

* In the new *Pharmacopœia* just published, *Vinum album* is ordered in the *Tinctura Thebaica*, for *Canary*.

EXP. X.

— In Brandy it gave a Tincture like the former, with the like Sediment ; for Brandy contains near equal Parts of true burning Spirit, that is, *totus ardens*, and Water. But I observed the Tincture of *Exp. 9.* which is nearly of the Strength of Brandy, in some Months after, had lost its yellow Colour intirely ; which I do not remember was the Case of the Brandy ; which argues somewhat more of a diluted or weak Acid in that than this : But, in both, the Blades of *Saffron* looked white and tough, as if all that was medicinal had been quite dissolved.

EXP. XI.

— In rectify'd Spirit Three Parts, common Water but (*d*) One Part, it gave a saturated Tincture, with little *Farina*, the Filaments remaining loose, white, and spent, like Tow. This kept its Colour till after Eighteen Months lying by, at which time it began to fade.

EXP. XII.

But *Saffron* macerated in plain rectify'd Spirit, that is, without any Addition of Water, gave as deep a Tincture as the former, with a small Portion of the above *Farina*, but the Blades were rigid, as if contracted by the Spirit, clay-colour'd, as if somewhat remained undissolved (not unlike *Exp. 6.* of this Chapter). This kept its rich Colour for Two Years, and still retains it : Yet if there be any Difference in extracting the Tincture of *Saffron* in these Two, the former Experiment with the small Addition of Water may seem best ; but, as the Difference is very minute,

(*d*) “ Itaque sæpius chemici, ut rectius fieri possit solutio, “ menstruum debilitant et infringunt.” *Freind de digestione, prælect. 5. p. 55.*

minute, this last, for its beautiful Colour, must be preferred.

From these Trials we find what various *Menstruums* may be had for this rich medicinal Matter ; tho' it imparted its Substance better to one than the other, yet it rejected none ; none, but what would take up sufficiently of that Medicine, were the others not to be had.

And that the Water, by *Exp.* 1. and the plain rectify'd Spirit, as also the same a little diluted, by *Exp.* 11. and 12. of this Chapter, extracted it best ; and that the *Canary* Wine, by *Exp.* 5. and 7. the worst ; yet we may safely say, that *Saffron* will dissolve in any *Menstruum*, from rectify'd Spirit to Water : For the same Substance that dissolves in and tinges the Spirit of Malt, dissolves also in the Water.

EXP. XIII.

For if you pour the Tincture made with the strong Spirit into Water, it does not turn it muddy or milky, as if it were a resinous or balsamic Substance, but the Mixture continues limpid ; and again, if you pour a Tincture made with Water into the strong Spirit of Malt, it produces no *Coagulum*, as if a saline or more gummy Substance chiefly had been dissolved in the Water ; for an homogeneous limpid Tincture arises from this Mixture also.

To what Class then of simple Medicines may we reduce this extracted Substance ; a Thing desired and not yet (*e*) determined ? It belongs to none of the foregoing Classes : — Perhaps it is a Soap, or somewhat

(*e*) “ Docet hoc experimentum mirum novam speciem materiae, quam vix oleum, spiritum, gummi, refinam, gummi-refinam, appellare possumus ; sed nec cera quoque est, nec balsamus : Quid ergo ? prorsus singulare quid ad oleosum spirituosum pertinens.” *Boerhaav. Elem. Chem. Tom. 2. p. 245.*

what inclining thereunto, of the volatile (*f*) aromatic Kind: Its dissolving in these Two remote *Menstruums*, rectify'd Spirit and Water, joined with the Uses it serves the Physician in, speaks much in favour of its saponaceous Quality. 'Tis a Deobstruent, from its Effects in the Jaundice; a powerful Diuretic, as (*g*) *Borellus* observes, by its passing by Urine in a deep bloody Colour; and a powerful (*h*) Antinephritic and Lithontriptic, if we may credit Authors of Repute, tho' not confirmed by the present Practice; Virtues that are now well known to belong to Soap.

As this Simple is of so volatile a Nature, as to suffer by lying by, if not properly preserved, how must it be injured in that Respect, when made into an Extract by (*i*) Evaporation, or dried before a Fire, for the more readily reducing it to Powder, as is too often the Case! It must, at least, lose some of its cordial Quality, tho' it may retain the aperitive.

As

(*f*) " Porro paratum hoc extractum patitur se misceri aquæ, spiritui, oleo." *Boerhaav. Chem. Tom. 2. p. 245. de Extract. Croci.*

(*g*) *Vid. Borell. Observat.*

(*h*) " Ut aqua ignem, sic crocus calcem calculi extinguit." *Paracels. de Tartar. p. 537. et ibid. Fragment. med. de Tartar. lib. 2. p. 484.*

" Imprimis medicamentum *Aroph* (quod sonat arōma philosophorum, &c.) præparatum sub fimo cum mixtura panis fecalini, ac postmodum spiritu vini extractum, curat inclinationem veterem ad calculum renum." To which he adds the Case of an *English* Baron, whom he had cured effectually with this Remedy, as appeared by Dissection, some Years after, at his Death. *Van Helmont de Lithiasi, cap. 7. pag. mei 58.* And Doctor *Boerhaave* tells us, this *Aroph* was made of *Saffron* (*de Extract. Croc.*), which *Hoffman* had likewise told us in these Words, " Exinde etiam *Aroph* *Paracelsi* præparatum, &c." *Manget. Mess. med. Spagyr. de Croco, p. 401.*

This History, joined to the former Circumstance of its breaking the Tenacity of *Aloes* readily, when compared with the Experiments in this Chapter, speaks in favour of its saponaceous Quality.

(*i*) As in the *Extract. Croc.* of *Boerhaave*, already referred to. *El. Ch. Tom. 2. p. 246.*

As to the *Farina* so much abounding in the more watry *Menstruums*, and so little in the more spirituous, I must only conjecture it to be that mealy Matter once lodged on the *Apices* of this Plant, called by Adepts in Botany, *Farina fœcundans*; which, as they say, is conveyed from thence to the Top of the *Pistillum*, which, in the *Saffron*, is the Three Filaments already mentioned; there to lie, till it impregnates the Rudiments of the Seed in the *Ovarium*. If so, it is of no further Use here, as being foreign to our Purpose.

As to the Difference of the Portions of this *Farina* in the above *Menstruums*, that may be caused by the watry *Menstruums* relaxing the Filaments, by which the Separation was the readier made; whilst the spirituous Liquors contracted and rendered them rigid, which may have prevented the Separation of this mealy-like Substance.

In order to draw up a *Formula* for the *Elixir Proprietatis*, we may conclude, from all the foregoing Trials, that the Myrrh, which will impart only its Balsam to rectify'd Spirit of Wine, and that best without the Addition of alkaline Salts, should be digested alone in that *Menstruum* with the (k) mildest Heat,

(k) “ Cæterum illi, qui medicamenta nulla arte, nisi spagyrica, nulla ratione, nisi igne, posse recte præparari, attento animo expendant, quod vina omnia medicata, et tincturæ plurimæ sine ignis auxilio optime conficiantur, atque sic ventriculo sint magis grata et accepta, sic corpori universo sint magis benefica, et profecto ignis spagyricus sæpenumero partes rerum crassiores, noxias, fæculentas, et impuras, una cum puris et salutaribus videtur cogere, et impellere, ut ex promiscua illa particularum adversantium conjunctione, fastidium, et nausea, ægritudo et perturbatio facile in ventriculo oriantur; cujus rei veritatem non solummodo frequenter in vinis medicatis, nunc cum igne, nunc sine igne, confectis observavi, sed maxime in *Elixir Proprietatis* dulci conficiendo.” *Harris de morbis acutis infantum*, p. 113.

Compare this Note with a Quotation from *Hoffman* (marked e) Page 29.

Heat, helping the Solution by *Agitation*, that thereby the Spirit, being free from any other Load, may the more readily penetrate this compound Gum, and dissolve that Balsam, which seems to be diffused thro' its Substance.

To this may be added the *Aloes*, digested likewise with a moderate Heat, that the fine Balsam of the *Myrrh* may not suffer by a Dissipation of its finer Parts; and also, lest too much Heat may injure the *Aloes* in its Virtues, in this *Menstruum*, as it does in a watry one. This Digestion is to be protracted, till the whole Substance of the *Aloes* be dissolved: A Thing practicable by the foregoing Experiments.

And, lastly, the *Saffron* may be added, and macerated, or the most mild Heat used, to dissolve its Substance, on account of its great Volatility (*l*).

But, if the whole Substance of the *Myrrh* be required in this Medicine, we find, from the same Trials, that that may be had by dissolving a Portion of the *Pil. Rufi*, by Trituration in a Mortar (like *Ammoniacum*) in any proper watery *Menstruum*, into an Emulsion, or, if the Prescriber pleases, by taking a proper Portion of *Myrrh*, *Aloes*, and *Saffron*, and treating them in the same manner, dissolving the *Aloes* and *Saffron* first: Here the *Aloes* will be readily subdued by the *Saffron* (as is proved in *Exp. 11.* on that Head); which, like a Soap, divides its Parts, by breaking its Tenacity, and becomes itself a mere Pulp; afterwards the *Myrrh* will dissolve by Trituration into an Emulsion (as by *Exp. 10.* on that Head) like the oily Gums, or Gum-Resins.

We

(*l*) “ An vero vulgares ejus præparationes (meaning the *Elixir Proprietatis*) magis peccent in festinando haud satis lente, an in electione *Myrrhæ*, aliorumque minus convenienti, an in spiritu nimis igneo perperam in usum recepto, an in omnibus illis respectibus simul sumptis, considerationem aliqualem fortasse meretur.” *Ibid. Harris, p. 114.*

We must observe here, that the Substance of the *Saffron* being mixed in this *Menstruum*, by its Pulpi-ness does not continue so long suspended, as the *Myrrh* would without it; and therefore, on subsiding, carries the *Myrrh* along with it sooner than it otherwise would: But, as the Form of this Mixture is an Emulsion, it soon re-assumes that Form, upon shaking the Vessel that contains it.

I must here advertise the Reader, that this Performance, if of any Use, has been finished near Two Years; but, being so unseasonably long detained in the Hands of Friends, to whose Judgment I paid so great a Regard, as to bear with such a Delay, I could not send it out sooner; that is, so as to have preceded the new *Dispensatory*, as was intended; in order to have contributed what was in my Power to so useful a Performance as a good *Pharmacopæia*. But if it be still found of Use, tho' late, I shall not spare my Pains in pursuing this Work farther, if nothing hinders.

F I N I S.

